

Regional Public Safety Communications in Broward County

A National Police Foundation Interim Review of the Impact of
Communications Systems and Processes on the Response to the
February 14, 2018 Marjory Stoneman Douglas High School Shooting



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The information—including findings and recommendations—contained in this interim report are based solely on the information made available to the NPF assessment team as of the date of publication. The NPF assessment team was unable to interview certain individuals and agencies so as not to adversely affect the Governor's MSDHS Public Safety Commission investigation and/or the criminal prosecution. Additionally, this NPF interim report was provided to Broward County before the governor's commission concluded its public hearings and provided its report to the governor.

A communications section will be included in the final NPF AAR, and more information may be developed that will change the initial findings. It is likely that as additional interviews are conducted and documents are reviewed, the NPF assessment team will refine specifics and enhance current findings and recommendations.

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Executive Summary

The Incident

On Wednesday, February 14, 2018, at 2:21 pm, a lone gunman entered Building 12 of Marjory Stoneman Douglas High School (MSDHS) in Parkland, Florida.¹ The gunman, a former student, killed 17 people and caused injury to 17 others.

Soon after the shooting began, numerous 911 calls were made by students, faculty, and staff at MSDHS, as well as from parents, guardians, and relatives of persons at the school. The 157 emergency 911 calls originating in Parkland were answered by emergency communications personnel assigned to the Coral Springs Emergency Communications Center and the Broward County Sheriff's Office (BSO) Regional Communications Division.² Pre-existing protocols directed all Enhanced 911 (E-911) cell phone calls originating in Parkland to be routed to the Coral Springs Emergency Communications Center and all landline calls to be answered by the BSO Regional Communications Division. Law enforcement services are provided to Parkland by the BSO. Fire/emergency medical services (EMS) are provided by the Coral Springs–Parkland Fire Department. The E-911 protocols and the fact that Parkland contracted public safety services to two separate organizations, with separate communication centers, required a series of call transfers, radio patches, and other one-off communication strategies to dispatch public safety resources to MSDHS.

Communications Challenges

As a result of these disparate and separate protocols and systems, the immediate and critically needed sharing of information was inhibited during the response. Emergency communications personnel in Coral Springs could not dispatch BSO deputies and their colleagues at BSO could not dispatch fire/EMS resources from Coral Springs. Call-takers and dispatchers at the respective emergency communications center were required to manually transfer calls and relay information between communication centers in order for law enforcement and fire/EMS personnel to be dispatched to MSDHS. Transferring calls from one public safety answering point (PSAP) to another adds approximately 30 seconds to each call.³ Additionally, calls that were not transferred or were dropped prevented the effective and efficient transfer of critical information to responding public safety personnel.

As public safety personnel from Coral Springs, the BSO, and the numerous jurisdictions surrounding Parkland responded to MSDHS, they struggled to find the correct radio channel(s) to communicate on and/or to monitor the incident. Many responders experienced disruptions on the radio system and

¹ Almurkhar, S., K.K. Rebecca Lai, Anjali Singhvi, and Karen Yourish. (2018, April 24). What Happened in the Parkland School Shooting. *The New York Times*. Retrieved from <https://www.nytimes.com/interactive/2018/02/15/us/florida-school-shooting-map.html>

² Broward County Sheriff's Office. (2018, March 8). Marjory Stoneman Douglas High School Shooting Time Line of Events. Retrieved from <https://app.box.com/s/jwall9dpcornuwn92xzy9hgl300xzton>. According to the state MSDHS Public Safety Commission, the number of 911 calls received on February 14, 2018, related to the incident at MSDHS was approximately 211. The BSO received approximately 81 calls and Coral Springs received approximately 130. For more, see the MSDHS Public Safety Commission communication timeline, November 13, 2018, retrieved from <http://www.fdle.state.fl.us/MeetingFiles.zip>

³ Mize, A. (2018, July 11). Broward Sheriff's Office Regional Communications. Retrieved from <http://www.fdle.state.fl.us/MSDHS/Meetings/July-Meeting-Documents/Presentations/July-11-930am-BSO-911-Systems-Angela-Mize.aspx>

manipulated their radios to try to find a clear channel, which caused further disruptions on the Broward County radio system.

Recognizing the communication challenges experienced during the MSDHS response, Broward County officials requested that the National Police Foundation provide an interim report to assist them in addressing the issues and to accelerate the implementation of recommendations. Officials in Broward County have already:

- established a formalized training program for radio use that is being used by law enforcement and fire/EMS personnel.⁴ In addition to training, the initiative includes the production and delivery of officer radio usage tips on palm cards⁵ and an online training video⁶;
- updated announcements to be used by dispatchers for radio operations during critical incidents;
- begun implementation of the Local Government Radio System to accommodate non public safety users and construction of the new P25 radio system;
- established a procedural agreement directing that when Coral Springs receives a Parkland fire call, once fire services are dispatched, Coral Springs police dispatch will use the district talk group to notify the BSO of the Coral Springs response;
- provided the Coral Springs Emergency Communications Center immediate access to a BSO radio set on the Parkland channel in their communications center, added ways for the Coral Springs Police Dispatch to monitor a Parkland channel, and programmed the BSO channel into the Coral Springs–Parkland Fire channel; and,
- programmed the main Coral Springs dispatch channel into the BSO dispatch console., affording direct radio communications and the ability for the BSO to initiate a patch.⁷

This After-Action Review Interim Report

In April 2018, Broward County, under the guidance of the [Broward County MSD After-Action Task Force](#), contracted the National Police Foundation (NPF) to conduct an independent after-action review (AAR) of the MSDHS incident. This step provides a critical opportunity for public safety agencies in Broward County to learn, collaborate, and improve the emergency communications systems, processes and procedures to best protect their community. Broward County should be commended for taking this step.

The full NPF AAR will examine public safety preparedness and response to the mass shooting incident, school safety and security, mental health services, as well as community and first responder recovery and resiliency following the event. Broward County administrators have requested this interim communications report to assist in identifying challenges surrounding the emergency communications processes that significantly impacted the public safety response to the MSDHS incident and to provide recommendations—based on national promising practices—that the county should consider implementing. Broward County administrators recognize that the final communications section in the NPF AAR could change as additional information is developed through the assessment process. The NPF continues to work with Broward County administrators to adjust the statement of work appropriately.

⁴ Broward County. (n.d.). Regional Communications and Technology Training. Retrieved from <http://www.broward.org/CommunicationsTechnology/Pages/Training.aspx>

⁵ Broward County. (n.d.). Radio Use Protocol in a Critical Incident. Retrieved from http://www.broward.org/CommunicationsTechnology/Documents/Radio_Tips_palm_card_v11_ONLINEADA.pdf

⁶ Broward County. (n.d.). Moving Forward: Broward's New 911 Radio System. Retrieved from http://broward.granicus.com/MediaPlayer.php?view_id=3&clip_id=3427

⁷ Marjory Stoneman Douglas High School Public Safety Commission. (2018, November 14-16). Commission meeting proceedings. Attended by NPF assessment team member, November 14-16.

The NPF assessment team faced restrictions regarding access to important details surrounding the incident and the response because of the ongoing criminal investigation and reviews being conducted by other organizations, including a comprehensive review commissioned by the Governor of Florida and the state legislature. The NPF assessment team, along with the Task Force, continues to collaborate with the other investigations and reviews, but did not receive the same level of access to the information regarding the MSDHS incident as did the state-level MSDHS Public Safety Commission. Therefore, the contents of this interim report are solely based on the information accessible to NPF assessment team members as of the date of publication.

In this interim report, the NPF assessment team focused on overarching systemic communications challenges faced by first responders to the MSDHS incident. Rather than focusing on all of the technical issues, which may be addressed by other reviews, this interim report examines the overall communications structures and processes that were in place on February 14, 2018. This interim report describes:

- the agencies responsible for providing public safety services to the City of Parkland and to MSDHS;
- the public safety communication systems that were in operation at the time of the incident;
- the events that occurred on February 14, 2018 at MSDHS and the public safety response;
- the communications system technology, protocols, and procedures, and their effect on the public safety response; and,
- national public safety communications best practices and systems.

The interim report concludes by providing seven (7) overarching findings and corresponding recommendations to improve public safety communications during major incidents in Broward County. Recommendations include re-evaluating call routing protocols; better aligning and coordinating system technology and protocols; developing a regional fleet map; and, refining, training, and practicing patching protocols. One of the primary findings of this interim report is that all of the public safety and government agencies in Broward County—including individual municipalities—share responsibility with regard to the communications challenges that confronted first responders on February 14, 2018. While the casualties and injuries caused are solely the responsibility of the perpetrator, it is the responsibility of all Broward County public safety and government agencies to construct strong communications systems and processes that can collectively support the public safety responses in the county. It is unavoidable that these systems and processes may become overtaxed and experience some technical issues during an incident of this magnitude. However, the collective inability of the public safety and government agencies in Broward County to cooperatively develop, prepare, and strengthen their systems created significant challenges in the response to the MSDHS incident.

Introduction

Incident Summary

On Wednesday, February 14, 2018, at 2:21 pm, a lone gunman entered Building 12 of Marjory Stoneman Douglas High School (MSDHS) in Parkland, Florida.⁸ With a semiautomatic rifle, the alleged gunman opened fire on students and staff members at his former school, killing 17 people and injuring 17 others.⁹ Before being confronted by law enforcement, the suspect discarded his rifle, a vest, and ammunition; left the building; and, fled the scene by blending in with other students.¹⁰ The suspect was apprehended approximately 80 minutes after the incident began—at 3:41 pm—on a residential street approximately two miles away, in neighboring Coral Springs.¹¹ By the time the attack was over, the shooting had become the deadliest shooting at a high school in the United States.¹²

Soon after the shooting began, numerous 911 calls were made by students, faculty, and staff at MSDHS, as well as from second and third-degree sources including parents, guardians, and relatives of persons at the school. In 73 minutes, 157 emergency calls originated from the City of Parkland and were answered by a combination of emergency communications personnel in the Coral Springs Emergency Communications Center and the Broward County Sheriff's Office (BSO) Regional Communications Division.¹³ Because of a pre-existing communications protocol that arose from the City of Parkland contracting with two separate agencies for public safety services—fire/emergency medical services (EMS) from the City of Coral Springs and law enforcement services from the BSO—all cellular 911 calls originating in Parkland were answered by emergency communications personnel at the Coral Springs Emergency Communications Center. Meanwhile, calls from landlines in Parkland were routed to the BSO Regional Communications Division. This resulted in the much smaller communications center receiving the majority of the emergency calls, including all but one originating from MSDHS (described in more detail beginning on page 9). Additionally, the lead law enforcement agency in the response—the BSO—was not receiving calls directly from victims at the scene and lacked critical information in their communications center.

Emergency communications personnel in Coral Springs could not dispatch BSO deputies and their colleagues in the BSO could not assign fire/EMS resources from Coral Springs. Call-takers and dispatchers at their respective emergency communications center were required to manually transfer calls and relay information between the centers in order for law enforcement and fire/EMS to be dispatched to MSDHS. Transferring calls from one public safety answering point (PSAP) to another adds an additional 30 seconds

⁸ Almukhtar, S., K.K. Rebecca Lai, Anjali Singhvi, and Karen Yourish. (2018, April 24). What Happened in the Parkland School Shooting. *The New York Times*. Retrieved from <https://www.nytimes.com/interactive/2018/02/15/us/florida-school-shooting-map.html>

⁹ Burch, A., and P. Mazzei. (2018, February 14). Death Toll Is at 17 and Could Rise in Florida School Shooting. *The New York Times*. Retrieved from <https://www.nytimes.com/2018/02/14/us/parkland-school-shooting.html>

¹⁰ Almukhtar, et al. What Happened in the Parkland School Shooting.

¹¹ Ibid.

¹² Willingham, AJ, and E. Levenson. (2018, April 20). 19 years ago, Columbine shook America to its core. Now, it's not even among the 10 deadliest shootings in modern US history. *CNN*. Retrieved from <https://www.cnn.com/2017/11/07/health/deadliest-mass-shootings-columbine-in-modern-us-history-trnd/index.html>

¹³ Broward County Sheriff's Office. (2018, March 8). Marjory Stoneman Douglas High School Shooting Time Line of Events. Retrieved from <https://app.box.com/s/jwall9dpcornuwn92xzy9hgl300xzton>. According to the state MSDHS Public Safety Commission, the number of 911 calls received on February 14, 2018, related to the incident at MSDHS was approximately 211. The BSO received approximately 81 calls and Coral Springs received approximately 130. For more, see the MSDHS Public Safety Commission communication timeline, November 13, 2018, retrieved from <http://www.fdle.state.fl.us/MeetingFiles.zip>

to each call.¹⁴ Additionally, calls that were not transferred or were dropped prevented the effective and efficient transfer of information among responding agencies.

Scope and Goals of the Review

Public safety communications systems are essential to an effective response to a critical incident. Emergency call-takers and public safety dispatchers play critical roles in providing immediate and sometimes life-saving aid to victims, facilitating the deployment of public safety resources to the scene of an incident, providing situational awareness, and relaying valuable information to first responders during a critical incident. Various communications technologies—including the 911 call taking system, the computer-aided dispatch (CAD) systems, and radio networks—connect co-responding police, fire/EMS, and hospital personnel to facilitate situational awareness and to coordinate responders activities on- and off-scene.

Since responding to an incident of this magnitude required the BSO, the Coral Springs–Parkland Fire Department, and numerous mutual aid agencies, the need for efficient and effective public safety communications was amplified and the agencies involved were required to rely on their existing communications structure, processes, technology, training, and relationships.

In April 2018, Broward County, under the guidance of the [Broward County MSD After-Action Task Force](#), contracted the National Police Foundation (NPF) to conduct an independent after-action review (AAR) of the MSDHS incident. The full AAR will examine public safety preparedness and response to the mass shooting incident, school safety and security, mental health services, as well as community and first responder recovery and resiliency following the event. The NPF assessment team, along with the Task Force, is collaborating with other ongoing investigations and reviews to identify gaps and adjust the statement of work appropriately. In August 2018, Broward County requested that the NPF prioritize a review of the public safety communications systems and processes that impacted the response to the MSDHS attack. Accordingly, this report provides an initial independent interim review of the public safety response to the February 14, 2018 mass casualty attack at MSDHS, focusing on public safety communications. The findings and recommendations in this report are meant to provide lessons learned for Broward County and other public safety agencies and jurisdictions nationwide.

Limitations of this Review

Broward County provided the NPF assessment team with commendable access and assistance in gathering information for this interim review.

However, because of ongoing criminal investigations and reviews by other organizations, the NPF assessment team faced restrictions regarding some of the important details surrounding the incident and the related response. Since the incident, at least 11 AARs, task forces, and committees have been commissioned to assess and investigate various aspects of the MSDHS incident. The Florida Department of Law Enforcement (FDLE) was commissioned by Florida Governor Rick Scott to conduct an investigation of the law enforcement response, the Florida House of Representatives—in conjunction with Governor Scott—commissioned a separate committee to conduct a comprehensive review of all aspects of the

¹⁴ Mize, A. (2018, July 11). Broward Sheriff's Office Regional Communications. Retrieved from <http://www.fdle.state.fl.us/MSDHS/Meetings/July-Meeting-Documents/Presentations/July-11-930am-BSO-911-Systems-Angela-Mize.aspx>

incident, and the City of Parkland contracted a review of police services and routing of its 911 calls. The Florida State Attorney for the 17th Judicial Circuit is also conducting a criminal prosecution of the suspect, who remains in custody.

The information—including findings and recommendations—contained in this interim report are based solely on the information made available to the NPF assessment team as of the date of publication. The NPF assessment team was unable to interview certain individuals and agencies so as not to adversely affect the Governor’s MSDHS Public Safety Commission investigation and/or the criminal prosecution. Additionally, this NPF interim report was provided to Broward County before the governor’s commission concluded its public hearings and provided its report to the governor.¹⁵

A communications section will be included in the final NPF AAR, and more information may be developed that will change the initial findings. It is likely that as additional interviews are conducted and documents are reviewed, the NPF assessment team will refine specifics and enhance current findings and recommendations.

Methodology

To conduct this review, the NPF assembled a team of subject matter experts with extensive experience in public safety communications, leadership, operations, decision-making, tactics, school facilities, and critical incident response. From May through November 2018, the NPF assessment team:

- conducted interviews;
- monitored the Governor’s MSDHS Public Safety Commission’s public meetings;
- reviewed interim reports, AARs, and other materials produced by other organizations investigating/reviewing the incident or aspects thereof;
- reviewed materials including audio and video from the incident, policies, procedures, official AARs, and other related reports on communications;
- reviewed incident data;
- examined open source media related to the incident;
- researched national promising communication models; and,
- studied AARs from previous mass casualty and school shooting incidents to provide a basis for this report.

Based on the analysis of this body of information, the NPF assessment team developed the interim findings and recommendations contained in this report. A full detailed methodology can be found in Appendix A.

Report Organization

The following section provides an overview of law enforcement and fire/EMS services in Broward County and the City of Parkland. The Maps and Timeline of Emergency Communications section provides an overview of the events that occurred on February 14, 2018, with a focus on public safety communications. The Communications in Parkland section examines the communications structure in the City of Parkland and Broward County. It notes the evolving system, protocols, policies, and procedures—including steps that have already been taken to work toward seamless public safety communications. The National

¹⁵ A public MSDHS Public Safety Commission hearing is scheduled for December 12-13, 2018.

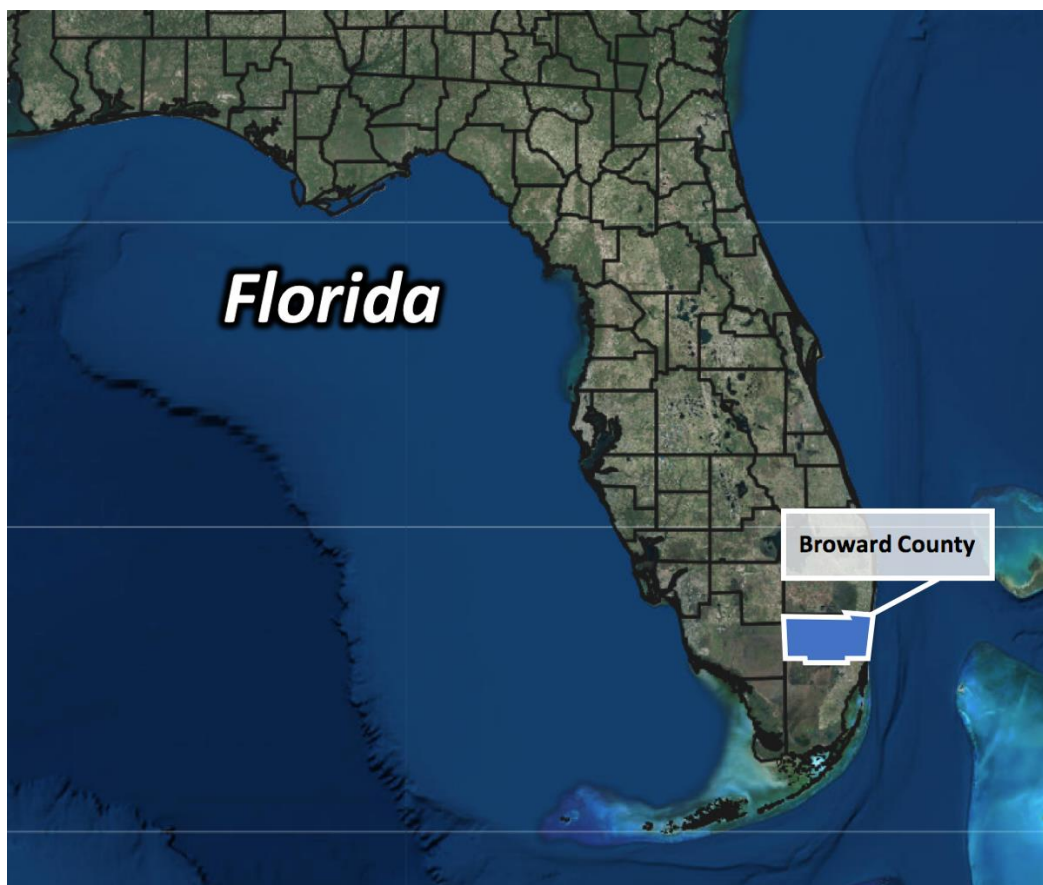
Communications Models section highlights national models in public safety communications for consideration. The Findings and Recommendations section details high-level findings and recommendations for public safety communications as they relate to the MSDHS incident. The Conclusion summarizes key themes and identifies topics for further study.

Background

About Broward County

Broward County is located in southeastern Florida, and was formed in 1915 from portions of Dade and Miami Beach Counties.¹⁶ Beginning with three incorporated communities, most of Broward County is now comprised of 31 incorporated municipalities, including Coral Springs, Fort Lauderdale, and Parkland.¹⁷ In 2017, Broward County had a total population—including the 31 municipalities—of approximately 1,935,878 residents, with its population growing over 10 percent from 2010 to 2017.¹⁸ The county is the second most populous in Florida and the seventh largest in size at 1,209 square miles.¹⁹

Figure 1: Map of Broward County in Florida



Source: Esri, Earthstar Geographics.

¹⁶ Broward County Historic Preservation Board. (n.d.). History of Broward County. Retrieved from <http://www.broward.org/History/Pages/BCHistory.aspx>

¹⁷ County. (n.d.). Broward County Municipalities. Retrieved from <http://www.broward.org/Publications/ResidentsGuide/Pages/BrowardCountyMunicipalities.aspx>

¹⁸ U.S. Census Bureau. (2017). QuickFacts: Broward County, Florida. Retrieved from <https://www.census.gov/quickfacts/browardcountyflorida>

¹⁹ Broward County Sheriff's Office. (n.d.). History of the Broward Sheriff's Office. Retrieved from <https://www.sheriff.org/Administration/Pages/History-of-the-Broward-Sheriff's-Office.aspx>

Broward County is governed by a county commission with nine members who are elected by district for four-year terms.²⁰ The commission members annually elect one among their number to be the mayor, who serves as the county's representative and ceremonial dignitary. The county commission appoints a county administrator, who is responsible to the commission for the administration of county matters including the day-to-day administration of county departments, divisions, offices, and agencies.²¹

About the Broward County Sheriff's Office

The Broward County Sheriff's Office (BSO) is the largest fully-accredited sheriff's office in the United States.²² The BSO has a total of more than 5,400 employees spread across operational, administrative, and support departments. The BSO is a full-service public safety agency that has the capacity to provide law enforcement, fire and emergency rescue, and dispatch services throughout Broward County.²³ Included in the 5,400 are approximately 2,800 certified deputies, more than 600 fire rescue personnel, and 447 communications personnel predominately organized into the Department of Law Enforcement (DLE) and the Department of Fire Rescue (DFR).

The BSO DLE provides full-time law enforcement services to the Broward County Courthouse, the Fort Lauderdale-Hollywood International Airport, areas of the Everglades and Port Everglades, and the unincorporated areas of the county—specifically in the northwest and central parts of Broward County.²⁴ Likewise, the BSO DFR provides full-time fire suppression, fire protection, and emergency medical services (EMS)—as well as Hazardous Materials, Air Rescue, Everglades Rescue, and Technical Rescue teams—throughout Broward County.²⁵ In addition to the full-time services provided to these unincorporated and special areas, the BSO maintains various types of service agreements with incorporated cities and towns within Broward County.

The BSO DLE, DFR, and the other BSO departments are further supported by a number of divisions, teams, and units. For example, the DLE is supported by the BSO Information Technology Division—which provides technology infrastructure and integration, computer/telecommunications support, and application development and support²⁶—and the BSO Regional Communications Division. However, as is discussed in more detail beginning on page 25, the Broward County Office of Regional Communications and Technology (ORCAT) is responsible for the technology and equipment for the County's Consolidated Regional 911 Centers, which is operated by the BSO Regional Communications Division under a contract between Broward County and the BSO.

²⁰ Broward County. (2016, November 8). Charter of Broward County, FL. Retrieved from <http://www.broward.org/Charter/Documents/CharterBrowardCountyRevisedNov82016.pdf>

²¹ Ibid.

²² Broward County Sheriff's Office. (n.d.). Office of the Sheriff. Retrieved from <https://www.sheriff.org/Administration/Pages/Office-Of-The-Sheriff.aspx>

²³ Broward County Sheriff's Office. (n.d.). Inside the Broward Sheriff's Office. Retrieved from <https://www.sheriff.org/Pages/About-Us.aspx>

²⁴ Broward County Sheriff's Office. (n.d.). Department of Law Enforcement. Retrieved from <https://www.sheriff.org/LE/Pages/Home.aspx>

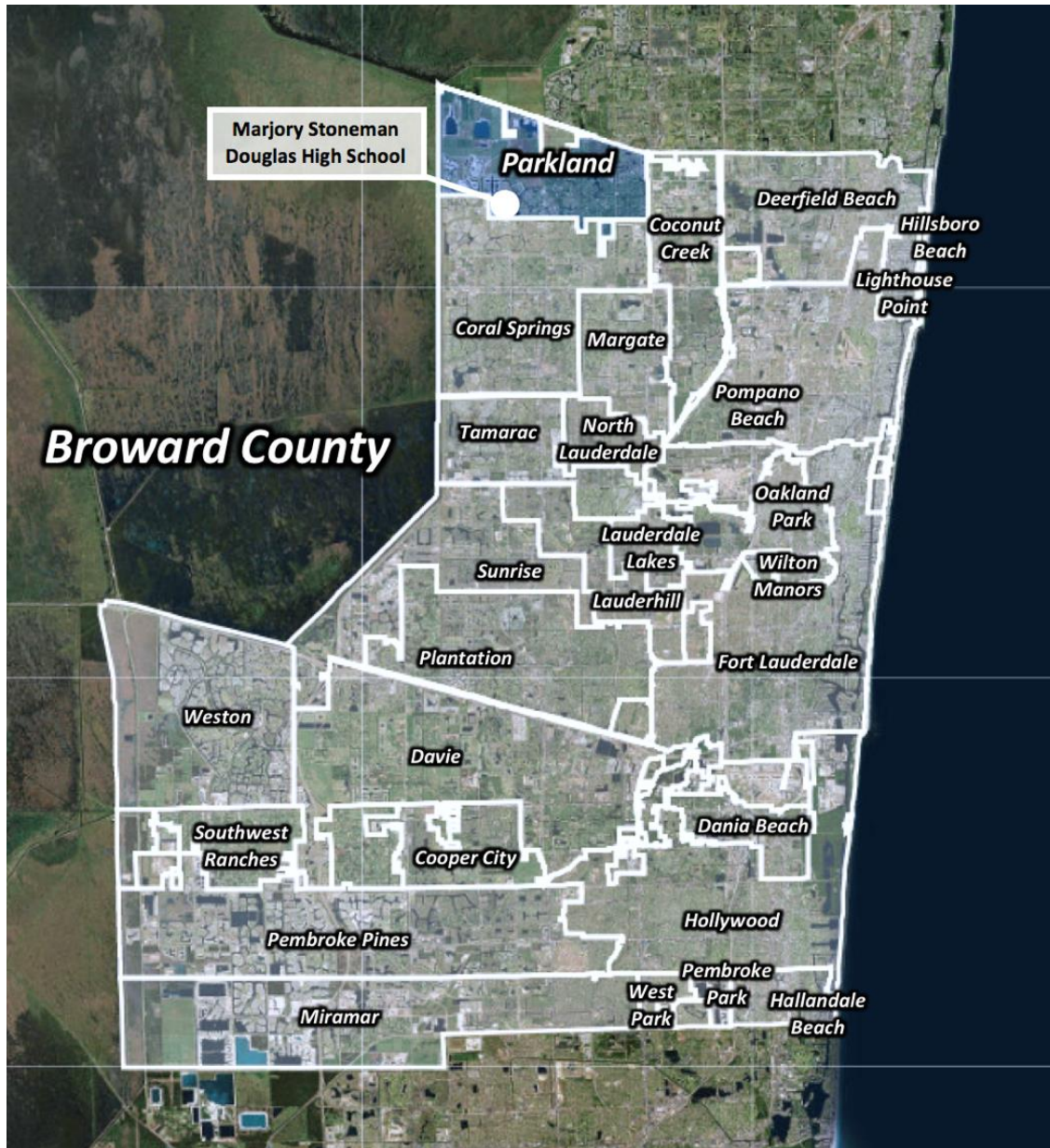
²⁵ Ibid.

²⁶ Broward County Sheriff's Office. (n.d.). Information Technology Division. Retrieved from <https://www.sheriff.org/Administration/Pages/IT.aspx>

About the City of Parkland

Incorporated in 1963, the City of Parkland, Florida, is a predominantly residential city of approximately 14.3 square miles located in the northwestern part of Broward County.²⁷ The city prides itself on multipurpose trails, numerous parks with sports field lighting and other amenities, and an equestrian center.²⁸ The western part of Parkland borders part of the Everglades Wildlife Management Area and the eastern part of the city is approximately 13 miles from numerous beaches that line the Atlantic Ocean.

Figure 2: Map of Broward County



Source: Esri, Earthstar Geographics, Broward County BMSD PRD EPGMD.

²⁷ City of Parkland. (n.d.). About Us. Retrieved from <https://www.cityofparkland.org/59/About-Us>

²⁸ Ibid.

The City of Parkland operates under a commission/city manager form of government. There are four commissioners that are each elected to represent geographically-divided districts and a mayor that is voted on by the entire electorate. The commissioners meet twice each month to carry out the legislative and policy-making functions of the city and appoint a city manager to oversee daily operations in Parkland.²⁹

Approximately 32,202 people live in Parkland, an almost 40 percent increase in population since 2010.³⁰ Additionally, almost one-third of the population (30.2 percent) of Parkland is under 18 years old.³¹ To accommodate for the school-age population, there are five public schools and two private schools in Parkland.³² MSDHS is the only public high school in Parkland and is the second largest high school in the Broward County Public School District. During the 2017-2018 school year, MSDHS had approximately 3,208 students from grades nine through twelve and 129 teachers.³³

Public Safety Services in Parkland

The City of Parkland contracts with the City of Coral Springs to provide fire/EMS and the BSO for law enforcement services. Both of these agencies have separate emergency communications centers. The communications centers serve as public safety answering points (PSAPs), receive 911 and non-emergency calls, and dispatch public safety personnel. It should be noted that the Coral Springs communications center receives all 911 cell phone calls from Parkland. Coral Springs is responsible for transferring 911 cell phone calls regarding law enforcement incidents to the BSO communications center.

Police

In February 2004, the Parkland City Commission disbanded its police department and contracted with the BSO to provide comprehensive law enforcement services to the city. The Parkland BSO District oversees all law enforcement and code enforcement throughout the City of Parkland.³⁴ The original contract between Parkland and the BSO was signed for a five-year period (expired in 2009). The contract was renewed for another five years (expired in 2014) after the initial period of performance. At the end of September 2014, the City of Parkland chose to operate on a month-to-month basis with the BSO, until August 2015, when the current five-year agreement (expires in 2019) was signed.

The agreement establishes the overall Parkland BSO staffing structure (see Figure 3 below), a minimum staffing of “one (1) Patrol Deputy Sheriff to cover each Patrol Zone Shift,” and shift schedule—currently 12-hour shifts—for BSO personnel in Parkland.³⁵ It also provides for Parkland to receive a number of services, “to the extent that such services would be provided by BSO to any and all other municipalities in

²⁹ City of Parkland. (n.d.). City Commission. Retrieved from <https://www.cityofparkland.org/127/City-Commission>

³⁰ U.S. Census Bureau. (2017). QuickFacts: Parkland city, Florida. Retrieved from <https://www.census.gov/quickfacts/fact/table/parklandcityflorida/PST045217>

³¹ Ibid.

³² City of Parkland. (n.d.). Schools. Retrieved from <https://www.cityofparkland.org/628/Schools>

³³ Diaz, J. (2018, February 14). Marjory Stoneman Douglas High School in Parkland: Facts about the site of mass shooting. *Sun Sentinel*. Retrieved from <http://www.sun-sentinel.com/local/broward/parkland/florida-school-shooting/fl-sb-stoneman-marjory-douglas-high-school-facts-20180214-story.html#>

³⁴ City of Parkland. (n.d.). Police Services (Parkland BSO District). Retrieved from <https://www.cityofparkland.org/878/Police-Services-Parkland-BSO-District>

³⁵ City of Parkland. (2014, August 12). Resolution No. 2015-90. Retrieved from <https://www.sheriff.org/Administration/MunicipalContracts/City%20of%20Parkland%20-%20DLE%20Services%20-%20100114.pdf>

Broward County that request such service irrespective of whether or not the CITY has a contract with BSO,” including E-911 law enforcement dispatch. The City of Parkland does provide the BSO with a Police Service Center to use as a district station in the city.³⁶

Figure 3: BSO Staffing Structure in Parkland

| Position | Number of Staff |
|---|-----------------|
| Captain | 1 |
| Executive Officer/Lieutenant | 1 |
| Deputy Sheriff Sergeants | 5 |
| Deputy Sheriffs | 22 |
| Deputy Sheriff Detectives | 3 |
| School Resource Deputies/Deputy Sheriff | 5 |
| Full-Time Civilian Code Enforcement Officers | 2 |
| Community Service Aides | 2 |
| Administrative Specialist | 1 |

Source: City of Parkland. (2014, August 12). Resolution No. 2015-90. Retrieved from <https://www.sheriff.org/Administration/MunicipalContracts/City%20of%20Parkland%20-%20DLE%20Services%20-%20100114.pdf>

In fiscal year 2017, (October 1, 2016 – September 30, 2017) the BSO responded to 20,025 calls-for-service in the City of Parkland.³⁷

Fire/EMS

Coral Springs began providing EMS services to the City of Parkland in 1996. In 2004, the two cities entered into an agreement to expand the services provided by Coral Springs to include fire. In August 2015, the City of Parkland approved a five-year contract to enhance the partnership that provided fire and emergency medical services with the City of Coral Springs, leading to the creation of the Coral Springs–Parkland Fire Department.³⁸

Three of the eight Coral Springs–Parkland Fire Department’s stations are located in the City of Parkland. In fiscal year 2017, the Coral Springs–Parkland Fire Department responded to 15,137 calls-for-service, of which 2,541 (16.8 percent) were located within the City of Parkland.³⁹

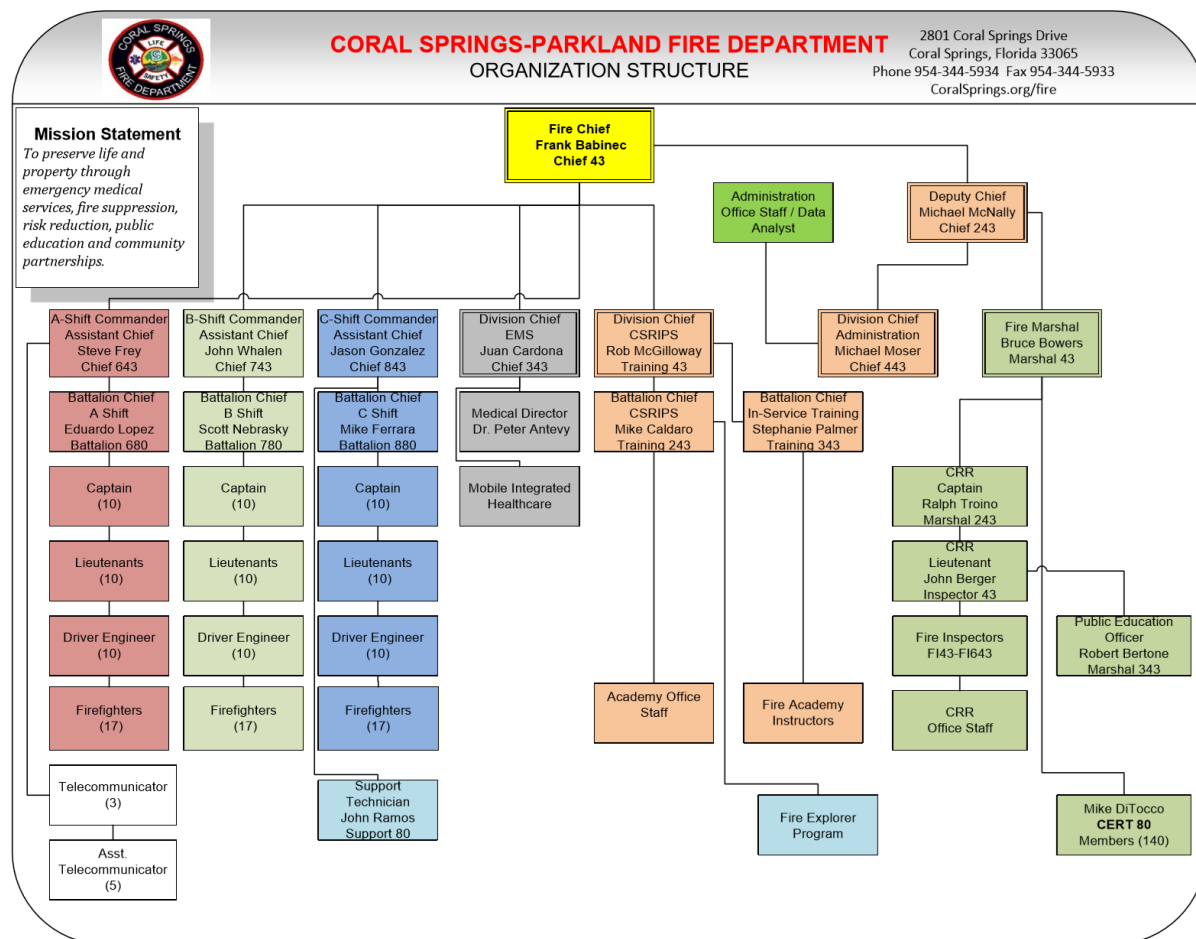
³⁶ Ibid.

³⁷ Broward County Sheriff’s Office. (2018). Proposed Budget: Fiscal Year 2018/2019. Retrieved from <https://www.sheriff.org/Administration/Documents/BudgetBooks/FY%202018-19%20Proposed%20Budget%20Book.pdf>

³⁸ Sivasankaran, A. (2015, August 3). Springs inks fire-EMS contract with Parkland. *Sun Sentinel*. Retrieved from <http://www.sun-sentinel.com/local/broward/parkland/fl-cspf-firecontract-0805-20150803-story.html>

³⁹ Coral Springs-Parkland Fire Department. (2017). Coral Springs Parkland Fire Department: Annual Report Fiscal Year 2017. Retrieved from <https://www.coral springs.org/government/other-departments-and-services/fire/about-us/annual-report>

Figure 4: Coral Springs–Parkland Fire Department Organization Chart



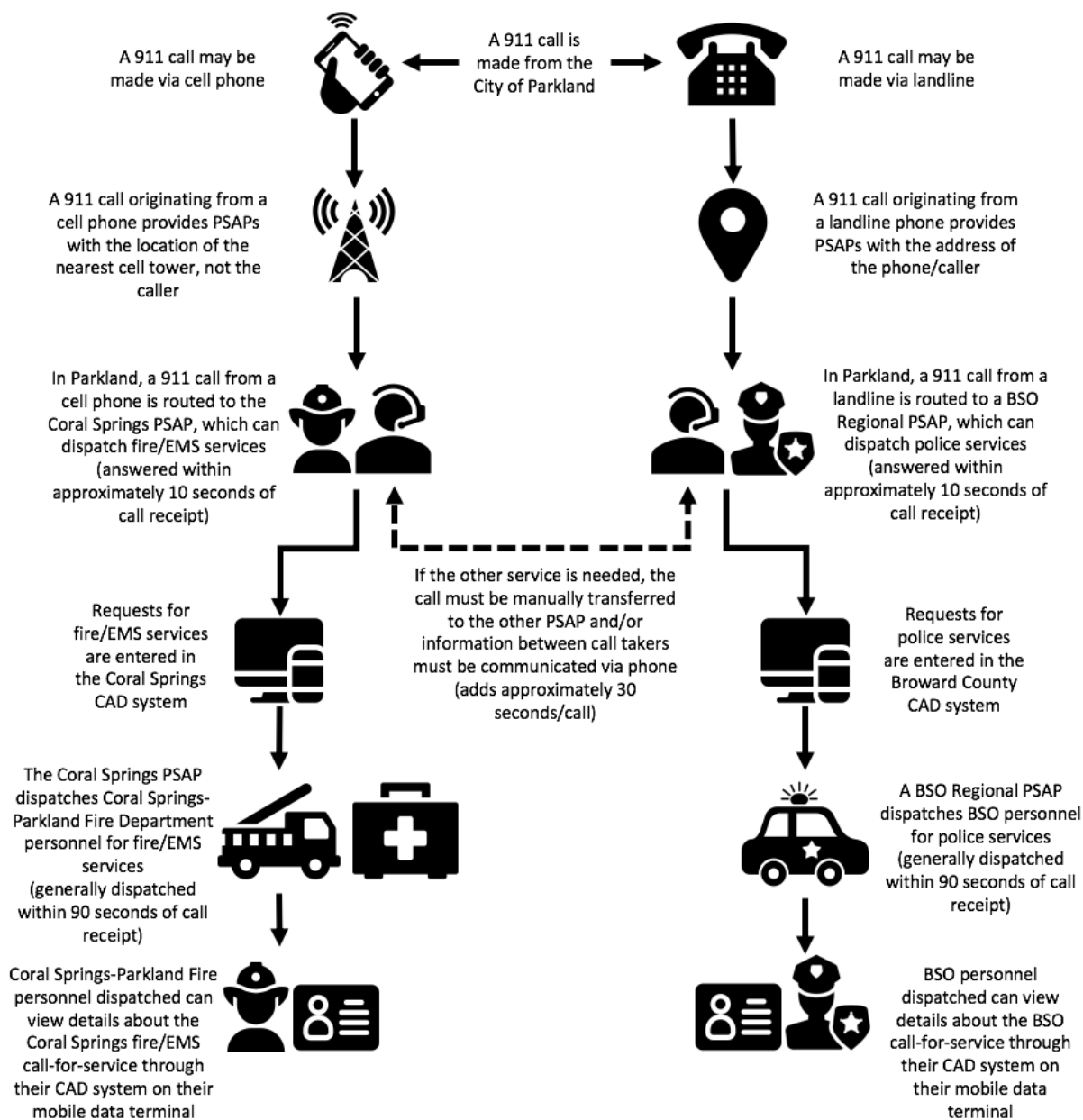
Source: Coral Springs–Parkland Fire Department. (n.d.). Organization Structure. Retrieved from <https://www.coral springs.org/government/other-departments-and-services/fire/about-us/organizational-chart>

Emergency Communications and Dispatch Services

In addition to the contracts for law enforcement and fire/EMS services in Parkland, the city also divided how E-911 calls are routed to PSAPs. As Figure 5 describes, E-911 calls from mobile devices physically located in Parkland are routed to the Coral Springs Emergency Communications Center’s PSAP. E-911 calls from landlines located in Parkland are routed to one of the three County PSAPs. The PSAPs are staffed by BSO communications personnel as per an agreement between the County and BSO.⁴⁰

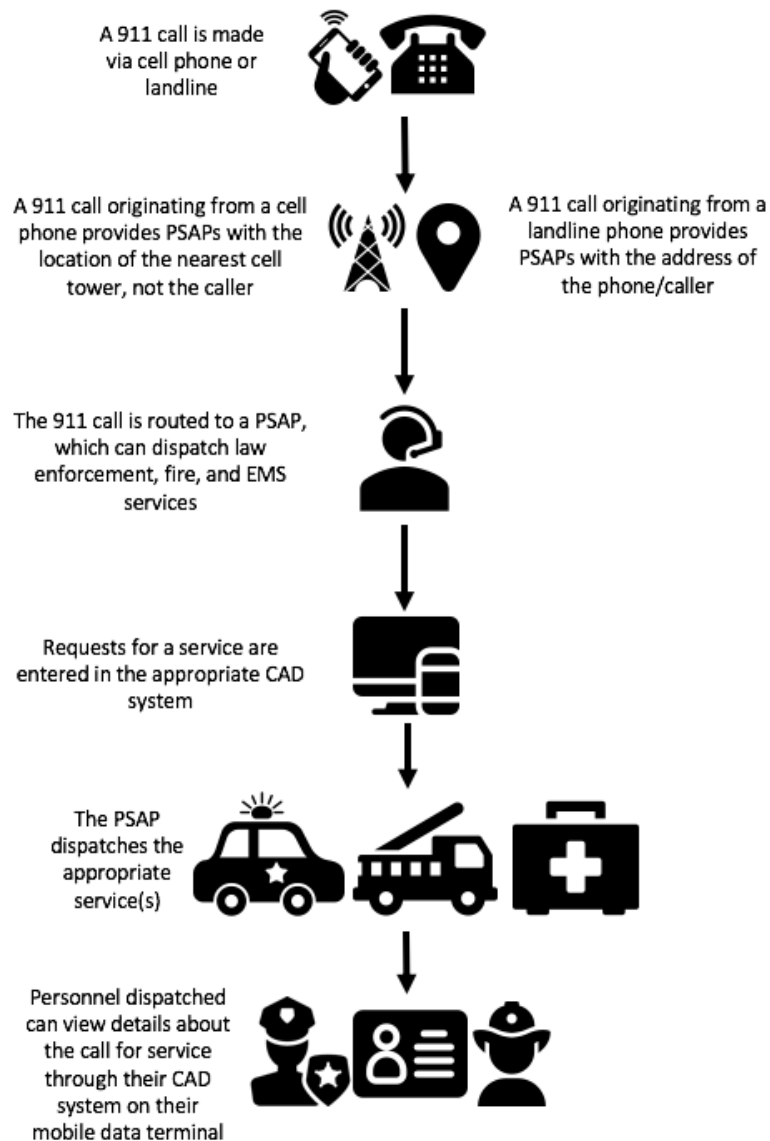
⁴⁰ Broward County. (2013, October 1). Agreement between Broward County and Sheriff of Broward County, Florida for The Operation of Call-Taking, Teletype (Queries Only) and Dispatch Services for the Consolidated Regional E-911 Communications System. Retrieved from <http://www.broward.org/CommunicationsTechnology/BoardsAndCommittees/4-C/Documents/OperatorsAgreement.pdf>

Figure 5: City of Parkland Emergency Communications (911 Call Taking and Dispatch) Process



Source: Icons made by Freepik taken from www.flaticon.com.

Figure 6: Standard Emergency Communications (911 Call Taking and Dispatch) Process



Source: Icons made by Freepik taken from www.flaticon.com.

Public Safety Communications

Emergency communications organizations—including the BSO Regional Communications Division and Coral Springs Emergency Communications Center—are involved in multiple public safety communications processes. These include:

- **911 Call Taking and Dispatch:** 911 call-takers at emergency communications centers receive 911 calls. They transfer and/or document the information in the appropriate computer-aided dispatch (CAD) system.
- **Computer-Aided Dispatch (CAD):** CAD systems support public safety responses by facilitating electronic communications between call-takers, dispatchers, and first responders. Dispatchers communicate with officers in the field, helping to connect them with real-time information.
- **Radio:** Radio systems enable responders to talk to one another, dispatch centers, and Incident Command during emergency response operations. Emergency communications organizations can initiate patches between disparate radio systems, enabling different agencies to talk on the same channel.

Sources: Marjory Stoneman Douglas High School Public Safety Commission meeting transcript, July 11, 2018, retrieved from <http://www.fdle.state.fl.us/MSDHS/Meetings/July-Meeting-Documents/July-11-2018.aspx>; Welles, M., How next-gen tech is transforming computer-aided dispatch, *EMS1*, retrieved from <https://www.ems1.com/ems-products/computer-aided-dispatch-CAD/articles/384289048-How-next-gen-tech-is-transforming-computer-aided-dispatch/>; SAFECOM and NCSWIC, Funding and Maintaining Public Safety Radio Systems, U.S. Department of Homeland Security, retrieved from https://www.dhs.gov/sites/default/files/publications/DHS_LMR%20Brochure_508_FINAL_WEB.pdf.

Additionally, because of the variations in public safety services provided to Parkland, if it is determined that a call-for-service received at the Coral Springs Emergency Communications Center is primarily a law enforcement incident, the call-taker must manually transfer the call to the BSO Regional Communications Division.⁴¹ Likewise, if a landline emergency call received by the BSO Regional Communications Division requires a fire/EMS response, the BSO call-taker must manually transfer the call to the Coral Springs Emergency Communications Center.

The BSO Regional Communications Division and the Coral Springs Emergency Communications Center operate under their own unique policies and procedures, and use different computer-aided dispatch (CAD) systems and radio systems.⁴² Broward County provides the infrastructure and maintenance of the County PSAPs, CAD, and radio system. Coral Springs manages and maintains their PSAP, CAD, and radio system independent of the county. Although the BSO and Coral Springs radio systems are technically interoperable, the CAD systems are not. Each of these systems depends on the actions of individual PSAP staff to share information with the other PSAP in a timely and appropriate manner during routine emergencies and crisis events.

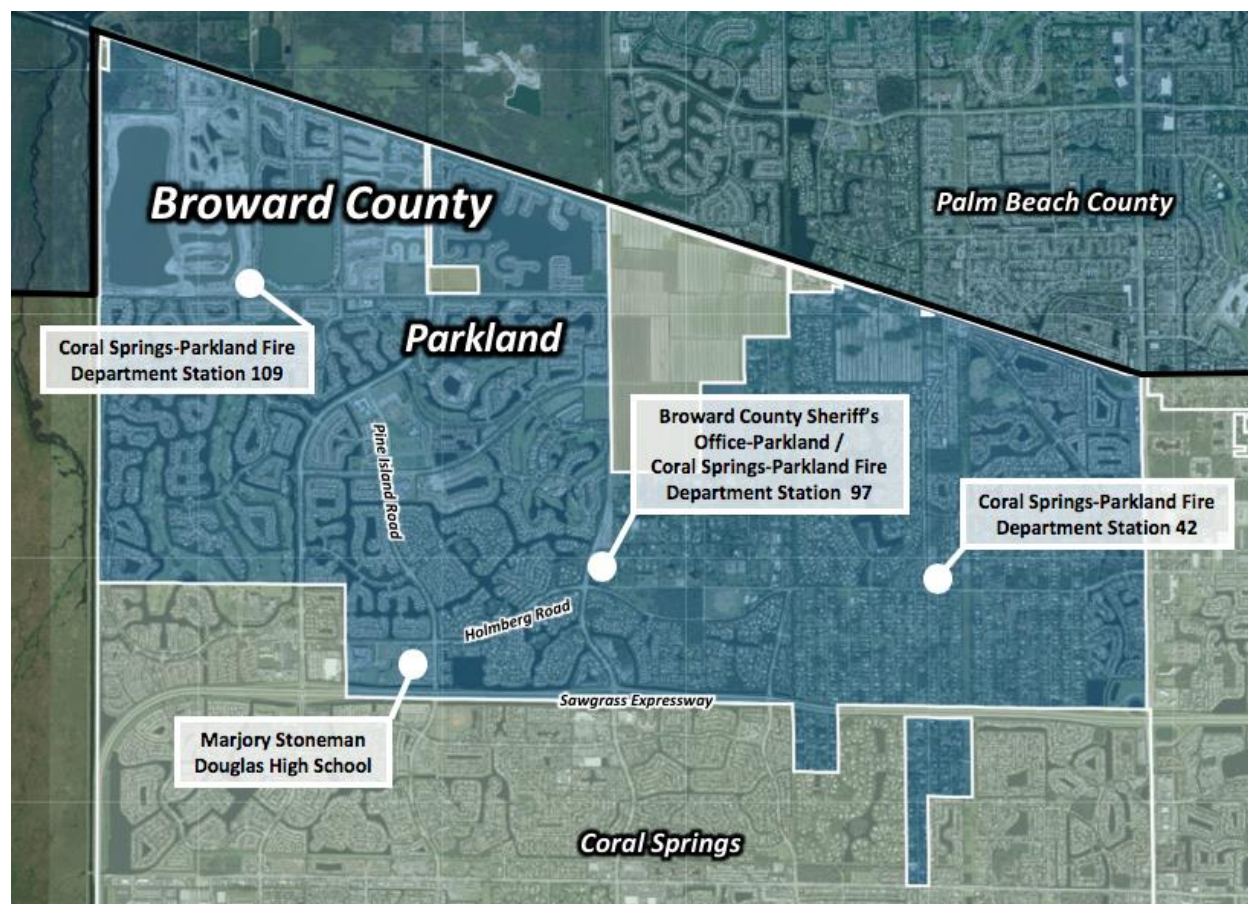
⁴¹ Coral Springs Police Communications Unit. (2017, November). Standard Operating Procedures. Provided by Broward County to NPF assessment team, June 15, 2018.

⁴² While several of these technology systems are 'compatible' or are provided by the same vendor, it is important to note that they do not automatically share information.

Maps and Timeline of Emergency Communications – February 14, 2018

The National Police Foundation (NPF) assessment team created the following maps and timeline of the public safety and emergency medical service (EMS) response to the shooting at Marjory Stoneman Douglas High School (MSDHS) based on information and documents made public by the MSDHS Public Safety Commission, the responding agencies, and media accounts. The maps provide visual depictions of important places in the response and the timeline provides a chronology of the events. All times are in Eastern Daylight Time.

Figure 7: Map of MSDHS and Emergency Services Locations in Parkland



Source: Esri, Earthstar Geographics, Broward County BMSD PRD EPGMD.

Timeline

At 2:21 pm, as school was about to be dismissed for the day, the alleged suspect entered Building 12, a three-story building also known as the “1200 building” or “freshman building,” and began shooting on the first floor (see Figure 8: MSDHS Campus Map).⁴³ Terror and confusion ensued. A fire alarm activated as a

⁴³ Broward County Sheriff's Office. (2018, March 8). Marjory Stoneman Douglas High School Shooting Time Line of Events. Retrieved from <https://app.box.com/s/jwall9dpcornuwn92xzy9hgl300xzton>

result of either the muzzle flash, smoke from the gun, or dust created from the percussion of the rifle.⁴⁴ The alarm was heard throughout the campus, initially prompting students and teachers to leave their classrooms before they realized what was going on.⁴⁵

Approximately one minute after the shooting began, at 2:22:13 pm, the Coral Springs Emergency Communications Center received its first 911 call from a cell phone caller in a classroom in Building 12 in reference to the shooting.⁴⁶ Within the minute, at 2:22:41 pm, a Coral Springs operator contacted the BSO Regional Communications Division with information that they were receiving calls of an active shooter at MSDHS. In total, from 2:22–3:35 pm, Coral Springs received an estimated 86 incoming 911 calls, the significant majority of which were related to the ongoing incident at MSDHS.⁴⁷ In the same time period, BSO Regional Communications received an estimated 71 calls directly, of which only one was identified as originating from the school, while the rest came from second-hand sources who were receiving text messages from students and faculty inside MSDHS or third-hand sources who were being relayed information to provide to 911.⁴⁸

By 2:23:13 pm, the Coral Springs Emergency Communications Center dispatched Coral Springs–Parkland Fire Department (CSPFD) personnel to MSDHS with engine 109 arriving first at 2:28 pm.⁴⁹ Coral Springs Police Department (CSPD) units would not be notified until minutes later when at 2:26 pm, a Coral Springs police officer radioed back to a Coral Springs dispatcher, asking for confirmation regarding what he heard from a passing CSPFD unit about an active shooter at MSDHS. Coral Springs dispatch confirmed that their 911 lines were “blowing up” with multiple calls about an active shooter and could hear gunshots in the background.⁵⁰

At the same time, at 2:23:26 pm, a BSO school resource deputy (SRD) assigned to MSDHS began advising over the BSO dispatch’s main channel for Parkland, 8-A, “Be advised we have possible, could be firecrackers, I think we have shots fired, possible shots fired – 1200 building.”⁵¹ A BSO dispatcher voiced

⁴⁴ Bonasoro, W. (2018, November 14). Presentation Regarding Physical Site and Site Security at MSDHS and Results of Teacher Interviews. Retrieved from <http://www.fdle.state.fl.us/MSDHS/Meetings/November-Meeting-Documents/Nov-14-830am-Site-Security-Wally-Bonasoro.aspx>

⁴⁵ Viglucci, A., K. Gurney, M. Navarro, C. Teproff, and M. Vassolo. How killer’s path through a school left 17 dead in six short minutes of terror. *Miami Herald*. Retrieved from <https://www.miamiherald.com/news/local/community/broward/article200661169.html>

⁴⁶ White, A. (2018, November 13). Presentation on 911 Calls Received; Law Enforcement and Fire/EMS Radio Transmissions; and Computer Aided Dispatch (CAD) Entries on February 14, 2018. Retrieved from [http://www.fdle.state.fl.us/MSDHS/Meetings/November-Meeting-Documents/MSDHS-Meeting-Agenda-Nov-13-16-FINAL-\(1\).aspx](http://www.fdle.state.fl.us/MSDHS/Meetings/November-Meeting-Documents/MSDHS-Meeting-Agenda-Nov-13-16-FINAL-(1).aspx)

⁴⁷ Broward County Sheriff’s Office. (2018, March 8). Marjory Stoneman Douglas High School Shooting Time Line of Events. Retrieved from <https://app.box.com/s/jwall9dpcornuwn92xzy9hgl300xzton>. According to the state MSDHS Public Safety Commission, the number of 911 calls received on February 14, 2018, related to the incident at MSDHS was approximately 211. The BSO received approximately 81 calls and Coral Springs received approximately 130. For more, see the MSDHS Public Safety Commission communication timeline, November 13, 2018, retrieved from <http://www.fdle.state.fl.us/MeetingFiles.zip>

⁴⁸ Broward County Sheriff’s Office. (2018, March 8). Marjory Stoneman Douglas High School Shooting Time Line of Events. Retrieved from <https://app.box.com/s/jwall9dpcornuwn92xzy9hgl300xzton>

⁴⁹ Coral Springs–Parkland Fire Department. (2018, April 11). CSPFD incident narratives related to the February 14, 2018 incident. Provided by Broward County to NPF assessment team, June 4, 2018.

⁵⁰ Broward County Sheriff’s Office. (2018, March 8). Marjory Stoneman Douglas High School Shooting Time Line of Events. Retrieved from <https://app.box.com/s/jwall9dpcornuwn92xzy9hgl300xzton>

⁵¹ White, A. (2018, November 13). Presentation on 911 Calls Received; Law Enforcement and Fire/EMS Radio Transmissions; and Computer Aided Dispatch (CAD) Entries on February 14, 2018. Retrieved from

an alert to all units of possible shots fired at MSDHS. Units advised back that they were en route.⁵² BSO and CSPFD call-takers continued to receive 911 calls, including reports of individuals shot in Building 12.⁵³

By 2:25 pm, another BSO deputy arrived on campus and reported, “I hear shots fired by the football field,” which is near Building 12 (see Figure 8 below).⁵⁴

Figure 8. MSDHS Campus Map



Sources: Google Earth, imagery date December 14, 2017. Labels taken from Broward County Sheriff's Office, (2018, April 24), Marjory Stoneman Douglas Shooting Overview, retrieved from <http://www.broward.org/Documents/MSD%20Overview%20Public%204-24-18.pdf>.

At 2:27 pm, one cell phone call directed to the Coral Springs Emergency Communications Center received a busy signal.⁵⁵

[http://www.fdle.state.fl.us/MSDHS/Meetings/November-Meeting-Documents/MSDHS-Meeting-Agenda-Nov-13-16-FINAL-\(1\).aspx](http://www.fdle.state.fl.us/MSDHS/Meetings/November-Meeting-Documents/MSDHS-Meeting-Agenda-Nov-13-16-FINAL-(1).aspx)

⁵² Broward County Sheriff's Office. (2018, March 8). Marjory Stoneman Douglas High School Shooting Time Line of Events. Retrieved from <https://app.box.com/s/jwall9dpcornuwn92xzy9hgl300xzton>

⁵³ White, A. (2018, November 13). Presentation on 911 Calls Received; Law Enforcement and Fire/EMS Radio Transmissions; and Computer Aided Dispatch (CAD) Entries on February 14, 2018.

⁵⁴ Broward County Sheriff's Office. (2018, March 8). Marjory Stoneman Douglas High School Shooting Time Line of Events. Retrieved from <https://app.box.com/s/jwall9dpcornuwn92xzy9hgl300xzton>

⁵⁵ Broward County Sheriff's Office. (2018, April 24). Marjory Stoneman Douglas Shooting Overview. Retrieved from <http://www.broward.org/Documents/MSD%20Overview%20Public%204-24-18.pdf>. According to the state MSDHS Public Safety Commission, one call to Coral Springs at 2:27 pm was routed to an administrative line because all of the other lines were full. For

The suspect continued his attack, shooting into hallways and classrooms as he walked through the first, second, and third floors of the building.⁵⁶ At 2:27 pm, approximately six minutes after the shooting started, the suspect discarded his weapon and blended in with the rest of the students and faculty evacuating the building.⁵⁷ The suspect walked south and then west through the campus and walked to the nearby Walmart west of the campus.⁵⁸

At 2:28 pm, the BSO SRD assigned to MSDHS warned, “Do not approach the 12 or 1300 building, stay at least 500 feet away at this point.”⁵⁹

By 2:29:47 pm, CSPD dispatch advised their officers of three victims down in room 1216.⁶⁰ At 2:30 pm, a BSO deputy who had connected with a CSPD officer relayed to BSO dispatch that Coral Springs was advising their units of “possibly three more victims, shooter possible inside 3 story building with an ROTC uniform.”⁶¹ Also at 2:30 pm, the BSO and Coral Springs began to address setting up a perimeter around the school.⁶²

At 2:32:42 pm, four CSPD officers entered Building 12 through the west doors.⁶³ These were the first law enforcement personnel to enter the building after the shooting started. Though they were not the first BSO deputies on scene, BSO deputies assisted with the rescue effort to extract victims from Building 12 and a deputy entered the building with a CSPD detective at 2:34:27 pm.⁶⁴

At 2:36 pm, 18 officers—including 14 from the CSPD and four from the BSO—converged on the east side of Building 12 and filtered in through the east doors over the next few minutes.⁶⁵ Public safety personnel cleared and evacuated Building 12 and the rest of the school. Others attended to the wounded and worked to extract and transport victims to area hospitals as quickly as possible.

The first CSPFD paramedics arrived at MSDHS at 2:28pm, followed by the CSPFD division chief, fire chief, and EMS chief each arriving within the next few minutes.⁶⁶ According to CSPFD personnel, after arriving on scene, the CSPFD began setting up teams to deploy rescue task force (RTF) elements; however, the

more, see the MSDHS Public Safety Commission communication timeline, November 13, 2018, retrieved from <http://www.fdle.state.fl.us/MeetingFiles.zip>

⁵⁶ Broward County Sheriff’s Office. (2018, February 21). Preliminary Timeline of Events. Retrieved from <https://app.box.com/s/9eqhp5gt9k/file/279067088020>

⁵⁷ Broward County Sheriff’s Office. (2018, April 24). Marjory Stoneman Douglas Shooting Overview. Retrieved from <http://www.broward.org/Documents/MSD%20Overview%20Public%204-24-18.pdf>

⁵⁸ Marjory Stoneman Douglas High School Public Safety Commission. (2018, November 14-15). Commission meeting proceedings. Attended by NPF assessment team member, November 14-15.

⁵⁹ Broward County Sheriff’s Office. (2018, March 8). Marjory Stoneman Douglas High School Shooting Time Line of Events. Retrieved from <https://app.box.com/s/jwall9dpcornuwn92xzy9hg1300xzton>

⁶⁰ Ibid.

⁶¹ Ibid.

⁶² Ibid.

⁶³ Camp, R., C. Massucci, and J. Suess. (2018, November 13). Law Enforcement Response to the MSDHS Shooting. Retrieved from <http://www.fdle.state.fl.us/MSDHS/Meetings/November-Meeting-Documents/Nov-14-100pm-Law-Enforcement-Response-John-Suess.aspx>

⁶⁴ Ibid.

⁶⁵ Ibid.

⁶⁶ Coral Springs-Parkland Fire Department. (2018, April 11). CSPFD incident narratives related to the February 14, 2018 incident. Provided by Broward County to NPF assessment team, June 4, 2018.

BSO commander repeatedly advised she would have to check before permitting them to enter.⁶⁷ After the initial ask, the CSPFD focused on setting up a triage/medical treatment area at the intersection of Pine Island Road and Holmberg Road, along with a CSPFD command post and staging area.⁶⁸ One nearby golf cart was used to transport victims to the CSPFD triage location.⁶⁹ At the BSO's request, the CSPFD's staging area was later moved to the football field.⁷⁰

Through Medical Communications (MEDCOM)—a statewide, multichannel radio system for medical communications—BSO dispatchers notified area hospitals that they would be receiving multiple shooting victims. The County CAD system recorded that Broward Health North and Coral Springs Medical Center were alerted at 2:28 pm.⁷¹ By the end of the day, public safety units transported eight victims to Broward Health North, seven to Broward Health Medical Center, and one to Broward Health Coral Springs.⁷² Two patients—among the most critically injured—were pronounced dead at Broward Health North.

While triage and transport of the victims continued and the immediate investigation began, additional law enforcement personnel continued to search for the suspect. Based on a description of the shooting suspect, a Coconut Creek Police Department officer⁷³ apprehended the suspect about one mile from MSDHS at 3:40 pm.⁷⁴ As the suspect was taken into custody, the rest of the response continued.

⁶⁷ Coral Springs-Parkland Fire Department. (2018, February 14-April 11). CSPFD incident narratives and statements related to the February 14, 2018 incident. Provided by Broward County to NPF assessment team, June 4-5, 2018.

⁶⁸ Coral Springs-Parkland Fire Department. (2018, April 11). CSPFD incident narratives related to the February 14, 2018 incident. Provided by Broward County to NPF assessment team, June 4, 2018.

⁶⁹ Coral Springs Police Department. (2018, April 27). Case Supplemental Report. Retrieved from https://www.dropbox.com/sh/c1rj82phqyu13zd/AADg7fuXhUHbUMz_wh4rEPxga/Police%20Reports?dl=0&subfolder_nav_tracing=1

⁷⁰ Coral Springs-Parkland Fire Department. (2018, April 11). CSPFD incident narratives related to the February 14, 2018 incident. Provided by Broward County to NPF assessment team, June 4, 2018.

⁷¹ Broward County Sheriff's Office. (2018, February 16). Incident Details. Provided by Broward County to NPF assessment team, June 1, 2018.

⁷² Broward Health. (2018, February 14). Broward Health Hospitals Receive 17 Patients from Stoneman Douglas Shooting. Retrieved from <https://www.browardhealth.org/news/news-articles/broward-health-hospitals-receive-17-patients-from-stoneman-douglas-shooting>

⁷³ Rabin, C. (2018, February 15). How a police officer captured the Parkland shooting suspect on the street. *Miami Herald*. Retrieved from <https://www.miamiherald.com/news/local/community/broward/article200318054.html>

⁷⁴ Broward County Sheriff's Office. (2018, March 8). Marjory Stoneman Douglas High School Shooting Time Line of Events. Retrieved from <https://app.box.com/s/jwall9dpcornuwn92xzy9hgl300xzton>

Communications in Parkland

Communications challenges during crisis events are not unusual and stem from technical issues, behavioral reactions of first responders in stressful situations, dysfunctional intergovernmental relations, inadequate procedures and training, and general lethargy over the need to institute special operating policies differing from routine habits and practices. Crisis events, as in the case of the MSDHS incident, challenge the first responder community to find new ways to prepare personnel for situations that will be unfamiliar, counter-intuitive, and overwhelming. First responders tend to revert to normal usage habits in times of crisis, instead of modifying their use of the radio system, exacerbating technical capabilities, contributing to system disruptions and/or failure.

In crisis, routine radio practices are accelerated and multiplied, squeezing communications into a limited communications system. “Examination of psychological and human factors demonstrates that the most robust radio systems imaginable may not deliver the expected results,”⁷⁵ an important consideration in the MSDHS response.

Broward County Infrastructure

The Broward County 911 emergency system was launched in 1975.⁷⁶ At that point, the county operated a call-taking and 911 system that covered its jurisdictions and each municipality operated their own system.

In 2002, Broward County citizens voted for the development of a county-wide Enhanced 911 (E-911) communications infrastructure.⁷⁷ The amendment to the County Charter held Broward County responsible for establishing and funding a countywide communications infrastructure for fire and emergency medical services (EMS).⁷⁸ At the time, the county was already responsible for establishing and maintaining the communications infrastructure for the Broward County Sheriff’s Office (BSO). In 2003, the County Commission transferred fire/EMS services to the BSO. In 2013, the County became responsible for the consolidation of the regional system and entered into an agreement with BSO for operation of teletype (queries only), calling taking and dispatching. Emergency dispatch throughout Broward County was consolidated, creating three dispatch centers—Coconut Creek, Pembroke Pines, and Sunrise—to service the county. It is important to note that two municipalities—Coral Springs and Plantation—elected to remain independent of the county communications system.⁷⁹ The consolidation of the countywide 911 system was one of the largest consolidations in the United States.⁸⁰

⁷⁵ Timmons, R. (2007, February). Interoperability: Stop Blaming the Radio. *Homeland Security Affairs*, 3 (1). Retrieved from <http://www.hsaj.org>

⁷⁶ Broward County Sheriff’s Office. (n.d.). History of the Broward Sheriff’s Office. Retrieved from <https://www.sheriff.org/Administration/Pages/History-of-the-Broward-Sheriff's-Office.aspx>

⁷⁷ Broward County Consolidated Communications Committee. (2012, March 7). Report and Recommendations for Cooperative Consolidation of E-911 Communications in Broward County, Florida. Retrieved from <https://www.sunrisefl.gov/modules/showdocument.aspx?documentid=2109>

⁷⁸ Jackson, T. (2018, July 11). Overview of Broward County’s Regional 911 System. Retrieved from <http://www.fdle.state.fl.us/MSDHS/Meetings/July-Meeting-Documents/Presentations/July-11-830am-911-System-Bertha-Henry.aspx>

⁷⁹ Wallman, B., and L. Trischitta. (2015, July 28). Broward County, Fla., Emergency 911 System Still Troubled. *Emergency Management*. Retrieved from <http://www.govtech.com/em/next-gen-911/-Broward-County-Fla-Emergency-911-System-Still-Troubled.html>

⁸⁰ Ibid.

Enhanced 911 (E-911)

A significant majority (at least 80 percent or more) of the approximately 240 million 911 calls made in the U.S. annually are from wireless devices. Unlike wired phones which are associated with a fixed location or address, 911 calls made via wireless devices are associated with the cell tower closest to the caller's location and are not entirely accurate, which presents challenges for call-takers at public safety answering points (PSAPs) nationwide. Enhanced 911 (E-911) is the capability of 911 systems to automatically report the telephone number and location of 911 calls made from wireless devices to the appropriate PSAP.

In E-911, phone companies use the automatic number identification (ANI) system to send the caller's phone number to the PSAP. Phone companies use the automatic location identification (ALI) system to identify the address from which the call originates. The ANI/ALI information provides call-takers with a more accurate sense of where the caller is located and can expedite the process of dispatching emergency resources.

To further facilitate identifying the locations of incoming emergency calls from wireless devices, in 2015, the Federal Communications Commission (FCC) adopted new E-911 rules that require commercial mobile radio service (CMRS) providers to comply with deadlines for implementing a series of indoor location accuracy standards.

Sources: NENA, About and FAQ, retrieved from <https://www.nena.org/page/aboutfaq2017>; Federal Communications Commission, 911 and E911 Services, retrieved from <https://www.fcc.gov/general/9-1-1-and-e9-1-1-services>; Federal Communications Commission, Indoor Location Accuracy Benchmarks, retrieved from <https://www.fcc.gov/public-safety-and-homeland-security/policy-and-licensing-division/911-services/general/location-accuracy-indoor-benchmarks>.

As a result of the consolidation, Broward County contracted with the BSO to staff the public safety answering points (PSAPs).⁸¹ The County is the responsible entity for providing of call-taking and dispatching services in the regional system. The contract delineates the roles and responsibilities of the County and BSO with regards to the E-911 system, establishing that the County is responsible for providing, "management, administration, and oversight of the Consolidated Regional E-911 Communications System," while the BSO is obligated to employ the personnel who work in the PSAPs and provide them necessary training.⁸² The contract also specifies that while BSO staff are responsible for handling all complaints related to performance of the E-911 communications system, the County is responsible for working with the vendor to resolve the issues.⁸³ Essentially, "BSO is responsible for the personnel, the staffing, the hiring, the training and development of those people, the evaluation and their skills assessment, and unfortunately any discipline that must be rendered due to performance or behavioral issues . . . Broward County handles everything technology, from the radio system to the computer aided dispatch system, to the telephone system and recording system, they are responsible for

⁸¹ Broward County Sheriff's Office. (n.d.). Regional Communications Dispatch and 911. Retrieved from <https://www.sheriff.org/LE/Pages/CommunicationsDispatch-911.aspx>

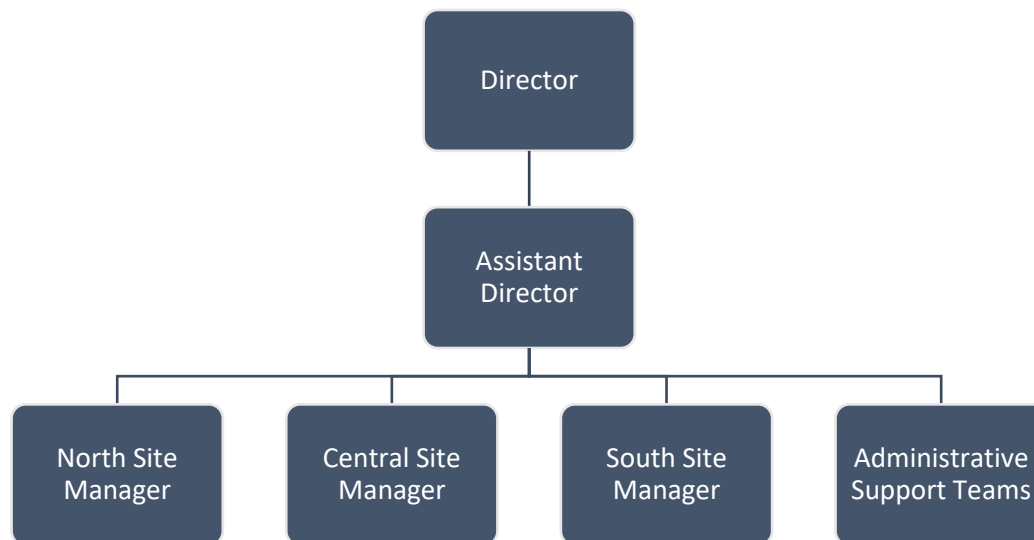
⁸² Broward County. (2013, October 1). Agreement between Broward County and Sheriff of Broward County, Florida for the Operation of Call-Taking, Teletype (Queries Only) and Dispatch Services for the Consolidated Regional E-911 Communications System. Retrieved from <http://www.broward.org/CommunicationsTechnology/BoardsAndCommittees/4-C/Documents/OperatorsAgreement.pdf>

⁸³ Ibid.

the procurement, for the implementation, for the upgrading, for the maintenance, and everything that comes in between.”⁸⁴

BSO fulfills its contractual requirements by operating a Communications Division—which operates under the BSO Department of Law Enforcement (DLE)—provides 911 intake, teletype, and dispatch services for all of the unincorporated areas of Broward County, for 21 municipalities⁸⁵ and special patrol areas including Port Everglades and Fort Lauderdale-Hollywood International Airport, the BSO Department of Detention and Department of Fire Rescue, court services, and the South Florida State Hospital.⁸⁶ It consists of an entirely civilian staff consisting of one Director and Assistant Director, three Site Managers and Assistant Site Managers, approximately 41 supervisors, and approximately 400 call-takers and dispatchers. The Division also includes a Teletype Unit, an Audio Evidence Unit, a Medical Quality Assurance Unit, a Quality Assurance Unit, and a Training Unit. The three BSO Regional Communications sites operate under common call-taking and dispatching protocols as well as common technology platforms.⁸⁷ The Division fields more than one million emergency calls, 1.25 million non-emergency calls, and 170,000 alarm calls and processes approximately 250,000 teletype requests annually.⁸⁸

Figure 9: BSO Regional Communications Command Structure



Source: Mize, A. (2018, July 11). Broward Sheriff’s Office Regional Communications. Retrieved from <http://www.fdle.state.fl.us/MSDHS/Meetings/July-Meeting-Documents/Presentations/July-11-930am-BSO-911-Systems-Angela-Mize.aspx>

⁸⁴ Marjory Stoneman Douglas High School Public Safety Commission. (2018, July 11). Commission meeting transcript. Retrieved from <http://www.fdle.state.fl.us/MSDHS/Meetings/July-Meeting-Documents/July-11-2018.aspx>

⁸⁵ While Parkland is not the only municipality that has contracts with separate agencies for law enforcement (BSO) and fire/EMS (Coral Springs–Parkland Fire Department) services, it is the only one that divides its routing of 911 calls between two different agencies.

⁸⁶ Broward County Sheriff’s Office. (n.d.). Department of Law Enforcement. Retrieved from <https://www.sheriff.org/LE/Pages/Home.aspx>

⁸⁷ Fitch & Associates, LLC. (2016, August). Phase I Report – Qualitative & Quantitative Findings: Assessment of Broward County’s Regional E911 Consolidated Communication Systems. Provided by Broward County to NPF assessment team, May 31, 2018.

⁸⁸ Broward County Sheriff’s Office. (n.d.). Regional Communications Dispatch and 911. Retrieved from <https://www.sheriff.org/LE/Pages/CommunicationsDispatch-911.aspx>

Independent Communications Centers

The hardware and software for the 911 systems used by both the BSO Regional Communications Division and the Coral Springs Emergency Communications Center are provided and serviced by the County through West Corporation.⁸⁹ Broward County—including the cities of Coral Springs and Plantation—is in the process of upgrading its 911 hardware and software to move towards a text-to-911 enabled system.⁹⁰ Despite these technological similarities, the BSO and the City of Coral Springs manage separate communications centers and have therefore developed different internal processes, responsibilities, capacities, and relationships in addition to using disparate computer-aided dispatch (CAD) and radio systems.

At the time of consolidation, incorporated municipalities within Broward County were given the opportunity to join the countywide E-911 system and have the BSO provide communications and dispatch services, or remain independent. Twenty-nine (29) of the thirty-one (31) municipalities joined the Regional Communications system, with only the cities of Coral Springs and Plantation deciding to remain independent. With their own communications centers, the two cities retain complete control of their E-911, radio, CAD systems, personnel, and training, but at a much smaller scale than the countywide communications centers operated by the BSO.

The Coral Springs Emergency Communications Center is housed within the Coral Springs Police Department and Fire Administration building in Coral Springs. Within the communications center, fire and police maintain their own communications processes. The communications center is responsible for answering and dispatching all police and fire/rescue services for Coral Springs, as well as dispatching fire/rescue calls for Parkland.⁹¹ The communications center has 11 answering positions.⁹² There are also nine (9) E-911 trunks,⁹³ fifteen (15) lines that are designated for non-emergency calls, and five (5) administrative lines. In the event that all nine (9) E-911 trunks are in use at the same time, additional incoming calls are diverted to one of the lines designated for non-emergencies.⁹⁴ In 2018, there were 38 telecommunicators assigned to answer, dispatch, and track Coral Springs police and fire units.⁹⁵ The Coral Springs emergency communications administrator reports to the administrative deputy chief of police and is tasked with ensuring that the telecommunicators are familiar with the service area geography and follow the appropriate protocols for a variety of circumstances and their particular roles.⁹⁶ The administrator oversees the unit which includes a communications technical coordinator, a training coordinator, and a shift supervisor.

⁸⁹ Marjory Stoneman Douglas High School Public Safety Commission. (2018, July 11). Commission meeting transcript. Retrieved from <http://www.fdle.state.fl.us/MSDHS/Meetings/July-Meeting-Documents/July-11-2018.aspx>

⁹⁰ Ibid.

⁹¹ Coral Springs Police Communications Unit. (2017, November). Standard Operating Procedures. Provided by Broward County to NPF assessment team, June 15, 2018.

⁹² See Appendix B: Glossary for a definition.

⁹³ See Appendix B: Glossary for a definition.

⁹⁴ Coral Springs Police Communications Unit. (2017, November). Standard Operating Procedures. Provided by Broward County to NPF assessment team, June 15, 2018.

⁹⁵ Babinec, F., S. Backer, and K. Liriano. (2018, July 11). Coral Springs Police and Fire Emergency Communications Center. Retrieved from <http://www.fdle.state.fl.us/MSDHS/Meetings/July-Meeting-Documents/Presentations/July-11-1045am-CSPD-911-System-Backer.aspx>

⁹⁶ Coral Springs Police Communications Unit. (2017, November). Standard Operating Procedures. Provided by Broward County to NPF assessment team, June 15, 2018.

In November 2016, the County reported that the BSO Regional Communications Division received 171,697 incoming calls, including 101,997 emergency 911 calls.⁹⁷ Call transfers from independent communications centers represented 0.72 percent of BSO Regional Communications' E-911 call intake and 6.20 percent of Coral Springs PSAP's and 16.32 percent of Plantation PSAP's total E-911 calls.⁹⁸

BSO Regional Call Taking and Dispatch Processes

When a person in Parkland calls 911 from a landline phone, their call is sent to BSO Regional Communications. Calls that are disconnected prior to being answered—which are almost always caused by the caller hanging up—are displayed in an abandoned call list so that operators can redial the caller to determine if an emergency exists. Calls that are connected are received by the first available operator at one of the three County PSAPs: North (located in Coconut Creek), Central (located in Sunrise), and South (located in Pembroke Pines). Call-takers are trained to answer the phone and immediately obtain and verify the location of the caller's incident, confirm the caller's phone number, determine the reference of the call, and generate a record of the event in the County CAD system if the call is meant for one of their regional partner agencies, all while continuing to talk to the caller to gather more information.⁹⁹

Once the record is generated in the County CAD system, the system automatically sends the record to the dispatcher at the correct PSAP location, based on geographical zoning associated with the address of the emergency, not necessarily the location of the caller.¹⁰⁰ The dispatcher is then responsible for dispatching or deploying the appropriate law enforcement and/or fire/EMS personnel based on the incident. Thus, a call for law enforcement services in Parkland may be received by a 911 operator at the South PSAP in Pembroke Pines, but is dispatched by the dispatcher located at the North PSAP in Coconut Creek. Regardless of where the call is dispatched from, the call is not transferred from the initial call-taker, and the original call-taker can continue to talk to the caller and update the CAD record while the dispatcher dispatches and directs first responders.

Alternatively, if BSO 911 call-takers receive a call that is meant for a non-regional partner agency, it must be manually transferred to that agency's communications center. Since mobile devices use the location of the nearest cell tower, instead of being associated with a physical address, transfers are especially common with calls made from mobile devices. Thus, after a BSO 911 call-taker confirms the location of the caller's incident, the call-taker must begin the process of transferring the call to the appropriate communications center. Once a call-taker from the other communications center answers, the BSO 911 call-taker must indicate that they are conducting a transfer and then inform the caller that they may continue speaking with the call-taker at the PSAP that the call was transferred to. Once the BSO call-taker ensures that the connection has been made, the call-taker may disconnect from the call.¹⁰¹

⁹⁷ Office of Regional Communications and Technology. (2016). Regional Consolidated Dispatch November 2016 Report. Retrieved from

<http://www.broward.org/CommunicationsTechnology/Reports/Documents/November%202016%20Consolidated%20Communications%20Monthly%20Report.pdf>

⁹⁸ Ibid.

⁹⁹ Marjory Stoneman Douglas High School Public Safety Commission. (2018, July 11). Commission meeting transcript. Retrieved from <http://www.fdle.state.fl.us/MSDHS/Meetings/July-Meeting-Documents/July-11-2018.aspx>

¹⁰⁰ Mize, A. (2018, July 11). Broward Sheriff's Office Regional Communications. Retrieved from <http://www.fdle.state.fl.us/MSDHS/Meetings/July-Meeting-Documents/Presentations/July-11-930am-BSO-911-Systems-Angela-Mize.aspx>

¹⁰¹ Marjory Stoneman Douglas High School Public Safety Commission. (2018, July 11). Commission meeting transcript. Retrieved from <http://www.fdle.state.fl.us/MSDHS/Meetings/July-Meeting-Documents/July-11-2018.aspx>

Coral Springs Call Taking and Dispatch Processes

Emergency 911 calls made from mobile devices in Parkland are routed to the Coral Springs Emergency Communications Center. When an emergency call is received at the Coral Springs Emergency Communications Center, a call-taker answers and determines the nature of the emergency. The call-taker is charged with ascertaining important details about the caller's emergency to determine the best way to dispatch the call and whether the nature of the emergency is police-related or fire/rescue. If it is determined that the call-for-service is primarily a law enforcement incident, the call-taker must manually transfer the call to the BSO Regional Communications Division. However, the Coral Springs call-taker must also remain on the line to determine if fire or EMS services are needed and to gather the necessary information for the dispatching of appropriate units.¹⁰² Additionally, if the primary nature of the call is for fire or EMS, but police are also needed, the call-taker must obtain the location of the incident, then transfer the call to the BSO and continue to get additional information.¹⁰³ Regardless of the nature of the call, all calls must be entered into the Coral Springs CAD system. The Coral Springs CAD system does not share information with County CAD, so information may also need to be entered into the County CAD. This is important to note in that critical safety flags and hazards that are captured in one system would not automatically be shared with responders using the other system. The CAD record includes an address and nature code of the event. If the call is for fire services, a CAD record is automatically generated for law enforcement as well for situational awareness.¹⁰⁴

Following the MSDHS incident, in agreement with the BSO, once Coral Springs responders are dispatched to a Parkland address, the Coral Springs police dispatcher will access the district talk group and announce the response to aid situational awareness for the BSO.¹⁰⁵

Computer-Aided Dispatch (CAD) System

In addition to the 911 systems and radio systems, separate CAD systems further complicated information-sharing between the two communications centers during the response to the MSDHS incident. In December 2016, the Coral Springs Emergency Communications Center deployed the Superior Public Safety ONESolution Computer Aided Dispatch System.¹⁰⁶ In March 2017, the Broward County purchased and implemented the Motorola Solutions PremierOne CAD system in the three County PSAPs operated by the BSO.¹⁰⁷ Although there had been initial discussions related to Coral Springs joining the regional CAD system, Coral Springs was already implementing its new CAD system, and chose not to join the consolidated regional system.¹⁰⁸

¹⁰² Coral Springs Police Communications Unit. (2017, November). Standard Operating Procedures. Provided by Broward County to NPF assessment team, June 15, 2018.

¹⁰³ Ibid.

¹⁰⁴ Ibid.

¹⁰⁵ Marjory Stoneman Douglas High School Public Safety Commission. (2018, July 11). Commission meeting transcript. Retrieved from <http://www.fdle.state.fl.us/MSDHS/Meetings/July-Meeting-Documents/July-11-2018.aspx>

¹⁰⁶ Coral Springs Police Department. (n.d.). Communications. Retrieved from <https://www.coralsprings.org/government/other-departments-and-services/police/divisions/communications>

¹⁰⁷ Broward County. (2017, March 28). County Employs State-of-the-Art 911 Technology. Retrieved from <https://webapps.broward.org/newsrelease/View.aspx?intMessageID=10342>

¹⁰⁸ Marjory Stoneman Douglas High School Public Safety Commission. (2018, July 11). Commission meeting transcript. Retrieved from <http://www.fdle.state.fl.us/MSDHS/Meetings/July-Meeting-Documents/July-11-2018.aspx>

Broward County's CAD system interfaces with all of the municipalities that participate in the consolidated E-911 systems within the county. This interfacing allows for municipal police and fire/EMS personnel to view important information regarding emergencies in their jurisdiction and dispatch their personnel without having the call transferred to them, expediting the deployment of emergency services.¹⁰⁹

However, the PremierOne CAD system used by the county does not interface with the CAD systems utilized by Coral Springs and Plantation.¹¹⁰ Coral Springs uses a Superion CAD system, which they upgraded to in December 2016.¹¹¹ Therefore, while calls can be transferred between PSAPs, CAD records created by BSO Regional Communications call-takers cannot be viewed by Coral Springs Emergency Communications Center call-takers and vice versa. The lack of interoperability and interfacing required dispatchers at each communications center to take additional steps to verbally relay details from incoming calls to one another.

In addition to the challenges caused by the lack of interoperability and interfacing between the two CAD systems, the Broward County CAD system was experiencing difficulties on February 14, 2018. The BSO had planned a change management request (CMR) with Motorola to conduct a database synchronization process that would move data from the county system to a virtual records data warehouse (RDW).¹¹² Motorola had worked with the BSO to gauge the optimal range of time to troubleshoot and optimize the synchronization process to reduce the impact on the CAD system.¹¹³ The update was planned without the approval of the County and the CMR was categorized as a Non-Emergency and Non-Service Affecting.¹¹⁴ Without the County's awareness, the synchronization was being conducted against the production database, instead of leveraging the county's backup systems to limit the exposure of the regular production systems.¹¹⁵

Therefore, at the time of the incident, CAD usage was already increased slightly above normal capacity, as approximately 45 percent of the central processing unit (CPU) usage was committed to the synchronization.¹¹⁶ This further exacerbated the increased system load caused by the number of incoming 911 calls and records being added to the CAD system during the MSDHS incident.¹¹⁷ At approximately 3:33 pm, the County information systems manager notified Motorola of, "a high priority incident involving a lot of activity to one CAD incident," which was causing approximately three to four seconds of slowness for CAD users at all sites for command executions.¹¹⁸ It was not until approximately 6:01 pm that evening that the issues with the CAD system speed had subsided.

¹⁰⁹ Ibid.

¹¹⁰ Broward County. (2017, March 28). County Employs State-of-the-Art 911 Technology. Retrieved from <https://webapps.broward.org/newsrelease/View.aspx?intMessageID=10342>

¹¹¹ Marjory Stoneman Douglas High School Public Safety Commission. (2018, July 11). Commission meeting transcript. Retrieved from <http://www.fdle.state.fl.us/MSDHS/Meetings/July-Meeting-Documents/July-11-2018.aspx>

¹¹² Emails between Broward County and Motorola Solutions, Inc. on CAD Slowness. (2018). Provided by Broward County to NPF assessment team, April 18, 2018.

¹¹³ Ibid.

¹¹⁴ Ibid.

¹¹⁵ Ibid.

¹¹⁶ Motorola Solutions. (2018, March 1). Post Mortem: CAD System Slowness. Provided by Broward County to NPF assessment team, April 18, 2018.

¹¹⁷ Emails between Broward County and Motorola Solutions, Inc. on CAD Slowness. (2018). Provided by Broward County to NPF assessment team, April 18, 2018.

¹¹⁸ Ibid.

Radio System

In addition to the disparate E-911 and CAD systems, separate radio systems and communications between Coral Springs and BSO personnel contributed to challenges in the response to the shooting at MSDHS.

The Broward County has approximately 23,000 potential radio users from 29 of the 31 municipalities within Broward County.¹¹⁹ In addition to BSO personnel, as part of the countywide communications infrastructure, the County allows for municipal first responder agencies who do not use BSO services to leverage the radio systems.¹²⁰ Non-public-safety county agencies—including the Department of Public Works, the Parks Department, and Broward County School Bus Transportation—are also connected to the countywide radio system. Broward County currently uses an 800 megahertz (MHz) trunked radio system operated through a Motorola Solutions hosted master site.¹²¹ According to a 2015 report by Mission Critical Partners, the Broward County radio system is facing multiple end-of-support dates for critical components.¹²² Broward County is currently in the process of replacing the aged system and implementing a local government radio system to transfer non-public safety users off the public safety radio system. In May 2017, the Board of County Commissioners approved an agreement between Broward County and Motorola Solutions, Inc. to replace the existing radio system with a new 700 MHz Association of Public-Safety Communications Officials (APCO) Project 25 trunked radio system.¹²³ The project is expected to be completed by the end of 2019.¹²⁴

All BSO personnel who serve regional functions (eg. Aviation) and limited Broward County government agency users are supplied Motorola radio equipment by the County. The County also provides the Regional Public Safety Intranet (RPSI)—which includes the County’s trunked radio system, public safety network, and public safety applications—and is responsible for implementation and maintenance of hardware and the software associated with the RPSI, including programming municipality radios and control stations for operation on the County’s radio system. The 29 municipalities that are part of the consolidated system—including those that have contracts with the BSO to receive law enforcement and/or fire/EMS services—are responsible for purchasing and maintaining their own radios and associated equipment. The municipalities are required to interface with the County system and adhere to the County system’s policies and standard operating procedures. The BSO and the individual municipalities are also responsible for conducting their own training and usage standards for their equipment, developing their own fleet maps—which consists of organizing their own channels and settings—and determining access to different channels based on roles and responsibilities. A fleet map determines how the system for each agency is controlled with talk groups, special event groups, channel loading, mutual aid channels, priority levels and control positions.¹²⁵

¹¹⁹ Broward County. (n.d.). Regional 911 Partners. Retrieved from <http://www.broward.org/CommunicationsTechnology/Pages/RegionalPartners.aspx>

¹²⁰ Ibid.

¹²¹ Mission Critical Partners. (n.d.). Presentation on Broward County Public Safety Radio System Replacement. Retrieved from <http://www.broward.org/CommunicationsTechnology/Documents/Presentation.pdf>

¹²² Mission Critical Partners. (2015, September). Comprehensive Radio Analysis Report. Provided by Broward County to NPF assessment team, April 18, 2018.

¹²³ Broward County. (n.d.). 911 Projects. Retrieved from <http://www.broward.org/CommunicationsTechnology/911Projects/Pages/InProgress.aspx>

¹²⁴ Ibid.

¹²⁵ WCCCA Technical Services. (2014, April). Fleet Mapping For Trunked Radio Systems. Retrieved from <http://www.wccca.com/users/forms/fleetmap.pdf>

The current Broward County regional radio system has 29 talk groups to support the regional users as well as countywide talk groups. The regional radio system in place during the response to MSDHS was only capable of accepting approximately 250 inbound requests-per-minute.¹²⁶ When a user turns on a radio, pushes to talk, or changes talk groups, that inbound request is processed through the system's controller, which is a built-in function that coordinates "traffic" between the radio sites.¹²⁷ The controller puts the actions, in order, for completion. This process is designed to allow the system to work its way through the queue of inbound requests at various levels of activity. When the queue becomes particularly long or the system gets close to 250 inbound requests-per-minute, it is commonly referred to as "throttling" or "bonking." Throttling is a safety mode that prevents the system from crashing completely from an overload of radio activity. Broward County has experienced this throttling at various times when there has been a heightened amount of use; however, it is usually for short periods of times and does not rise to a problem level.¹²⁸

Separate from the BSO, the City of Coral Springs uses their own radio system, which they upgraded to in May 2015 after their old system reached its end of life.¹²⁹ Like Broward County's radio system, Coral Springs's 800 MHz P25 Phase I Motorola trunked system is tied to Motorola's hosted master site.¹³⁰ In 2013, the City of Coral Springs retained RCC Consultants, Inc., to conduct an assessment of the city's public safety radio communications system and operating environment and requirements. Coral Springs officials report that at the time, based on the assessment, considering their needs in a new radio system, and considering Broward County's existing system and timeframe for migrating to a new system, the City of Coral Springs sought to upgrade and retain their own standalone radio system.¹³¹ In addition to Coral Springs, as of 2015, the cities of Fort Lauderdale, Hollywood, and Plantation operated their own primary radio systems.¹³²

Users of different public safety radio systems should be able to connect with users on other systems through a few different means. In addition to regional system users, radios from the independent municipalities of Coral Springs and Plantation can also be connected to the regional system by utilizing a "patch."¹³³ A patch is a technical bridge between two radio systems typically set up by the host agency to connect the external agency to a particular group or channel on the host's system. In order to patch, the host agency must be aware of the other agency's talk groups to be patched to. Patches are typically set

¹²⁶ The Motorola 700 MHz P25 radio system currently being implemented by Broward County will have a capacity of approximately 750 inbound requests-per-minute. Marjory Stoneman Douglas High School Public Safety Commission. (2018, December 12). Draft Findings & Recommendations Initial Report. Retrieved from <http://www.fdle.state.fl.us/MSDHS/Meetings/2018/December-Meeting-Documents/MSD-draft-rec-and-findings-with-target-hardening.aspx>

¹²⁷ Mission Critical Partners. (2015, September). Comprehensive Radio Analysis Report. Provided by Broward County to NPF assessment team, April 18, 2018.

¹²⁸ Marjory Stoneman Douglas High School Public Safety Commission. (2018, July 11). Commission meeting transcript. Retrieved from <http://www.fdle.state.fl.us/MSDHS/Meetings/July-Meeting-Documents/July-11-2018.aspx>

¹²⁹ Ibid.

¹³⁰ Mission Critical Partners. (2015, September). Comprehensive Radio Analysis Report. Provided by Broward County to NPF assessment team, April 18, 2018.

¹³¹ Babinec, F., S. Backer, and K. Liriano. (2018, July 11). Coral Springs Police and Fire Emergency Communications Center. Retrieved from <http://www.fdle.state.fl.us/MSDHS/Meetings/July-Meeting-Documents/Presentations/July-12-830am-CSPD-Radio-System-Backer.aspx>

¹³² Mission Critical Partners. (2015, September). Comprehensive Radio Analysis Report. Provided by Broward County to NPF assessment team, April 18, 2018.

¹³³ See Appendix B: Glossary for a definition.

up on shared mutual aid talk groups so that disparate systems can communicate, allowing first responders from mutual aid agencies to interact on scene.¹³⁴

Additionally, some systems can also “multi-select” where the users on two different systems cannot hear each other but can both hear the same dispatcher broadcasting messages.¹³⁵ During the response to MSDHS, since the mass casualty shooting was primarily a law enforcement response, the BSO was considered the host agency. First responder personnel from Coral Springs requested to be patched to the regional system to try and communicate with all the responding agencies arriving on scene. The regional system dispatcher did not have Coral Springs’ main channels on their console, so they were unable to create the patch necessary to coordinate the two agencies. A Coral Springs dispatcher then initiated the patch, which was created successfully; however, it was reported that there were still difficulties communicating on the patched channel.¹³⁶

From 2:33 pm to 5:43 pm on February 14, the BSO radio users experienced “throttling,”¹³⁷ which created a busy signal or generated an error message when personnel attempted to use the radio system.¹³⁸ Responding deputies, SWAT operators, and command personnel identified the inability to transmit over their radios as a point of major frustration which led to officer safety concerns.¹³⁹ By 2:41 pm, one BSO deputy reported having problems transmitting over the radio.¹⁴⁰ At 2:47 pm, the BSO captain who was the commander overseeing Parkland was unable to transmit over the radio.¹⁴¹ In an interview, the captain noted that her radio was as good as a brick.¹⁴²

In an attempt to impose radio discipline, at 3:11 pm, approximately 50 minutes after the incident began, the BSO Regional Communications Division sent a text message to law enforcement and fire command staff advising all units to hold radio traffic unless it was related to the active shooter.¹⁴³

In addition to the throttling issues, the BSO and Coral Springs responders attempted to coordinate their efforts but had trouble with radio interoperability. The Coral Springs Police Department received a call from a BSO duty officer¹⁴⁴—who is responsible for supervising the operations of their PSAP during their shift and monitoring the DLE talk group to facilitate the rapid dissemination of information—who advised

¹³⁴ Marjory Stoneman Douglas High School Public Safety Commission. (2018, July 11). Commission meeting transcript. Retrieved from <http://www.fdle.state.fl.us/MSDHS/Meetings/July-Meeting-Documents/July-11-2018.aspx>

¹³⁵ Ibid.

¹³⁶ NPF assessment team interview with City of Coral Springs personnel, June 6, 2018.

¹³⁷ NPF assessment team interview with Office of Regional Communications and Technology personnel, May 30, 2018.

¹³⁸ Letter from Motorola Solutions to Broward County Office of Regional Communications and Technology. (2018, March 16). Broward County Trunked Radio system Site Trunking event on Wednesday February 14, 2018. Provided by Broward County to NPF assessment team, April 18, 2018.

¹³⁹ Camp, R., C. Massucci, and J. Suess. (2018, November 13). Law Enforcement Response to the MSDHS Shooting. Retrieved from <http://www.fdle.state.fl.us/MSDHS/Meetings/November-Meeting-Documents/Nov-14-100pm-Law-Enforcement-Response-John-Suess.aspx>

¹⁴⁰ Broward County Sheriff’s Office. (2018, April 24). Marjory Stoneman Douglas Shooting Overview. Retrieved from <http://www.broward.org/Documents/MSD%20Overview%20Public%204-24-18.pdf>

¹⁴¹ Associated Press. (2018, July 12). Parkland shooting investigation finds radio issues delayed police response. *NBC News*. Retrieved from <https://www.nbcnews.com/news/us-news/parkland-shooting-investigation-finds-radio-issues-delayed-police-response-n890901>

¹⁴² Ibid; Camp, R., C. Massucci, and J. Suess. (2018, November 13). Law Enforcement Response to the MSDHS Shooting. Retrieved from <http://www.fdle.state.fl.us/MSDHS/Meetings/November-Meeting-Documents/Nov-14-100pm-Law-Enforcement-Response-John-Suess.aspx>

¹⁴³ NPF assessment team interview with Office of Regional Communications and Technology personnel, May 30, 2018.

¹⁴⁴ See Appendix B: Glossary for a definition.

that the BSO did not have the Coral Springs main channel on their consoles to initiate a patch.¹⁴⁵ BSO personnel on scene may have had the technical capacity to join the Coral Springs channel, however doing so would have prevented them from being able to communicate with their own dispatch. Since the BSO system did not have Coral Springs' main channel on the BSO console, the BSO could not initiate a system "patch" that would allow the different agencies to communicate on the same channel. The BSO duty officer asked Coral Springs to patch the Coral Springs main channel to 14-OPS-2, a mutual aid channel assigned for interagency communication. Coral Springs did so and advised of a patch at 2:44 pm. The patch was abandoned by some users at 2:47 pm,¹⁴⁶ because it was reported that there were issues communicating with and hearing other first responders on the patched channel.¹⁴⁷

In response to the attack at the Pulse Nightclub in 2016, an Orlando Police Department (OPD) lieutenant—who was also the on-duty watch commander—assumed incident command immediately upon arriving on scene. As the lieutenant was responding to the scene and after assuming command he controlled radio traffic. In addition to providing tactical instructions, he also reminded OPD responders to stay off their radios unless they were providing information critical to the response. This quick action allowed dispatchers to provide information that they were obtaining from 911 calls originating from inside the nightclub and to assign specific radio channels based on tasks and at the request of the incident commander. Additionally, dispatchers relayed information regarding the location of the incident command posts and unified command center throughout the response, which facilitated inter-agency communications. The radio discipline throughout the response alleviated many of the potential challenges associated with having more than 300 first responders from 27 agencies on scene.¹⁴⁸

Hospital Communications

In any critical incident with injured or wounded victims, coordination with emergency room (ER) personnel at appropriate area hospitals is important to facilitate life-saving medical care. This involves first responders and EMS personnel communicating information from the scene to their respective communications centers so that dispatchers can deploy resources and coordinate with the ERs.

According to the Florida Regional Common EMS Protocols,¹⁴⁹ once EMS personnel arrive at the scene of a mass casualty incident—such as the MSDHS incident—the first-arriving unit is responsible for establishing command, estimating the number of victims, requesting the appropriate level response, identifying a

¹⁴⁵ Marjory Stoneman Douglas High School Public Safety Commission. (2018, July 12). Commission meeting transcript. Retrieved from <http://www.fdle.state.fl.us/MSDHS/Meetings/July-Meeting-Documents/July-12-2018.aspx>

¹⁴⁶ Broward County Sheriff's Office. (2018, April 24). Marjory Stoneman Douglas Shooting Overview. Retrieved from <http://www.broward.org/Documents/MSD%20Overview%20Public%204-24-18.pdf>

¹⁴⁷ NPF assessment team interview with City of Coral Springs personnel, June 6, 2018.

¹⁴⁸ Straub, F., J. Cambria, J. Castor, B. Gorban, B. Meade, D. Waltemeyer, and J. Zeunik. (2017). Rescue, Response, and Resilience: A critical incident review of the Orlando public safety response to the attack on the Pulse Nightclub. Washington, DC: Office of Community Oriented Policing Services. Retrieved from <https://www.policefoundation.org/publication/rescue-response-and-resilience-a-critical-incident-review-of-the-orlando-public-safety-response-to-the-attack-on-the-pulse-nightclub/>

¹⁴⁹ The *Florida Regional Common EMS Protocols* is a set of general medical treatment protocols that have been developed as part of the medical direction program for participating Emergency Medical Services (EMS) agencies. The protocols are also intended to provide emergency departments with sufficient notification of incoming patients to allow for appropriate preparations to be made. The original Florida Regional Common EMS Protocols were developed by a group of physicians, EMS Chiefs, training officers, and field paramedics. The protocols have been updated and tailored specifically to Broward County by the Greater Broward EMS Medical Directors' Association. For more information, see: Greater Broward EMS Medical Directors' Association. (2016, September). Florida Regional Common EMS Protocols Section 1: General Protocols. Retrieved from <http://gbemda.org/wp-content/uploads/2012/02/Section1GeneralProtocols-5thEditionVersion3Feb22016.pdf>

staging area, and performing triage and treatment.¹⁵⁰ The estimated number of victims and the level of response, including any additional units and/or specialized equipment, should be communicated to the dispatching agency's communications center as quickly as possible, so that resources can be deployed.¹⁵¹

When there are patients with immediately life-threatening injuries, it is the responsibility of communications center dispatchers to notify the nearest appropriate trauma center of "Trauma Alert" patients. EMS personnel transport adult trauma alert patients to the appropriate adult trauma hospital and pediatric trauma alert patients—defined as age 15 or younger—to the appropriate pediatric trauma hospital.¹⁵² Transport to the appropriate trauma center is generally determined by catchment areas¹⁵³ designed by a team of pre-hospital personnel, EMS medical directors, and county officials, and is reviewed bi-annually.¹⁵⁴ Medical Control serves as the medical resource coordination center that maintains awareness of hospital capacity and directs patients to the appropriate hospital.¹⁵⁵

Both the BSO Regional Communications Division and the Coral Springs Emergency Communications Center have medical communications (MEDCOM) protocols, which discuss the process for notifying hospitals of incoming patients in their Standard Operating Procedures. For the BSO, the medical resource coordination role is filled by a MEDCOM Operator and is responsible for, "radio communications between field personnel and hospital base stations."¹⁵⁶ The BSO MEDCOM Operator also, "establishes radio patches between field personnel and a designated hospital, and coordinates high priority incidents on the Medical Resource Channel (MRC)."¹⁵⁷ When an incident occurs with patients of critical status, the primary dispatcher or field personnel notifies the MEDCOM Operator, either directly or through the MedCom10 radio channel, who then notifies hospitals through a "hospital pre-alert." During a pre-alert, the MEDCOM Operator notifies emergency room personnel at the appropriate hospital via landline phone to help them prepare for the patient's arrival, relaying the patient(s) and transporting unit(s) information.¹⁵⁸

Meanwhile, the Coral Springs Emergency Communications Center personnel are required to call hospitals by phone to relay important information to them. The Emergency Medical Services Dispatcher, "provides dispatch services by analyzing, prioritizing, and processing calls while maintaining radio contact with responders to ensure safe, efficient, and effective responses to calls for emergency medical services."¹⁵⁹

¹⁵⁰ Florida Regional Common EMS Protocols. Mass Casualty Incidents. Retrieved from <http://www.frcemsp.com/protocols/section-1-general-protocols/mass-casualty-incidents>

¹⁵¹ Ibid.

¹⁵² Greater Broward EMS Medical Directors' Association. (2016, September). Florida Regional Common EMS Protocols Section 1: General Protocols. Retrieved from <http://gbemda.org/wp-content/uploads/2012/02/Section1GeneralProtocols-5thEditionVersion3Feb22016.pdf>. Trauma Transport Protocol. Retrieved from <http://frcemsp.com/>.

¹⁵³ See Appendix B: Glossary for a definition.

¹⁵⁴ Broward County. (2012). Trauma Plan 2012 to 2017. Retrieved from <https://www.broward.org/MedicalExaminer/Documents/TraumaPlan2012to2017.pdf>

¹⁵⁵ Florida Regional Common EMS Protocols. Mass Casualty Incidents. Retrieved from <http://www.frcemsp.com/protocols/section-1-general-protocols/mass-casualty-incidents>

¹⁵⁶ Broward County Sheriff's Office. (2017, January 20). Regional Communications Operations: Standard Operating Procedures Manual. Provided by Broward County Sheriff's Office to NPF assessment team, June 29, 2018.

¹⁵⁷ Ibid.

¹⁵⁸ Ibid.

¹⁵⁹ Coral Springs Police Communications Unit. (2017, November). Standard Operating Procedures. Provided by Broward County to NPF assessment team, June 15, 2018.

Additionally, on scene, paramedics are expected to use the MEDCOM radio channel to communicate with their dispatch and when en route to the hospital with patients, communicate with hospital personnel via the appropriate MEDCOM radio channel the following information:

1. Rescue number/paramedic's name calling the alert;
2. Name of the receiving trauma center;
3. Category (i.e. adult or pediatric);
4. Trauma alert criteria;
5. Patient's sex;
6. Number of patients; and,
7. Estimated time of arrival to the receiving facility.¹⁶⁰

On February 14, 2018, paramedics at MSDHS triaged the victims on scene and EMS personnel transported them to local hospitals and trauma centers. In interviews, hospital staff lauded the paramedics—from various EMS agencies—who provided victims with potentially life-saving care on scene.¹⁶¹ One email from the Broward Health North medical director for the emergency department noted that during pre-hospital care, “every patient was cared for to the highest standards . . . Ranging from swift on-scene evaluations, the appropriateness of tourniquets and application of bleeding dressings, adherence to Advance Trauma Life Support standards, concise and well defined communications, expedited transport times to the rapid transition of care to our ED team.”¹⁶²

Over the course of the incident, public safety units transported eight victims to Broward Health North, seven to Broward Health Medical Center, and one to Broward Health Coral Springs.¹⁶³ All operating under the same hospital system, Broward Health North is a Level II adult trauma center approximately 10 miles from MSDHS, Broward Health Medical Center is a Level I trauma center that also serves as a pediatric trauma center approximately 30 miles from MSDHS, and Broward Health Coral Springs is a hospital approximately three miles from MSDHS (see Figure 10 below). Each local EMS service has a medical director who provides medical leadership, and each hospital's emergency department has a medical director who is responsible for the medical management of the facility's emergency physicians.¹⁶⁴ Through the MEDCOM system, dispatchers alerted local hospitals, including trauma centers, that they would be receiving gunshot victims.

¹⁶⁰ Florida Regional Common EMS Protocols. Medical Communications. Retrieved from <http://www.frcemsp.com/protocols/>

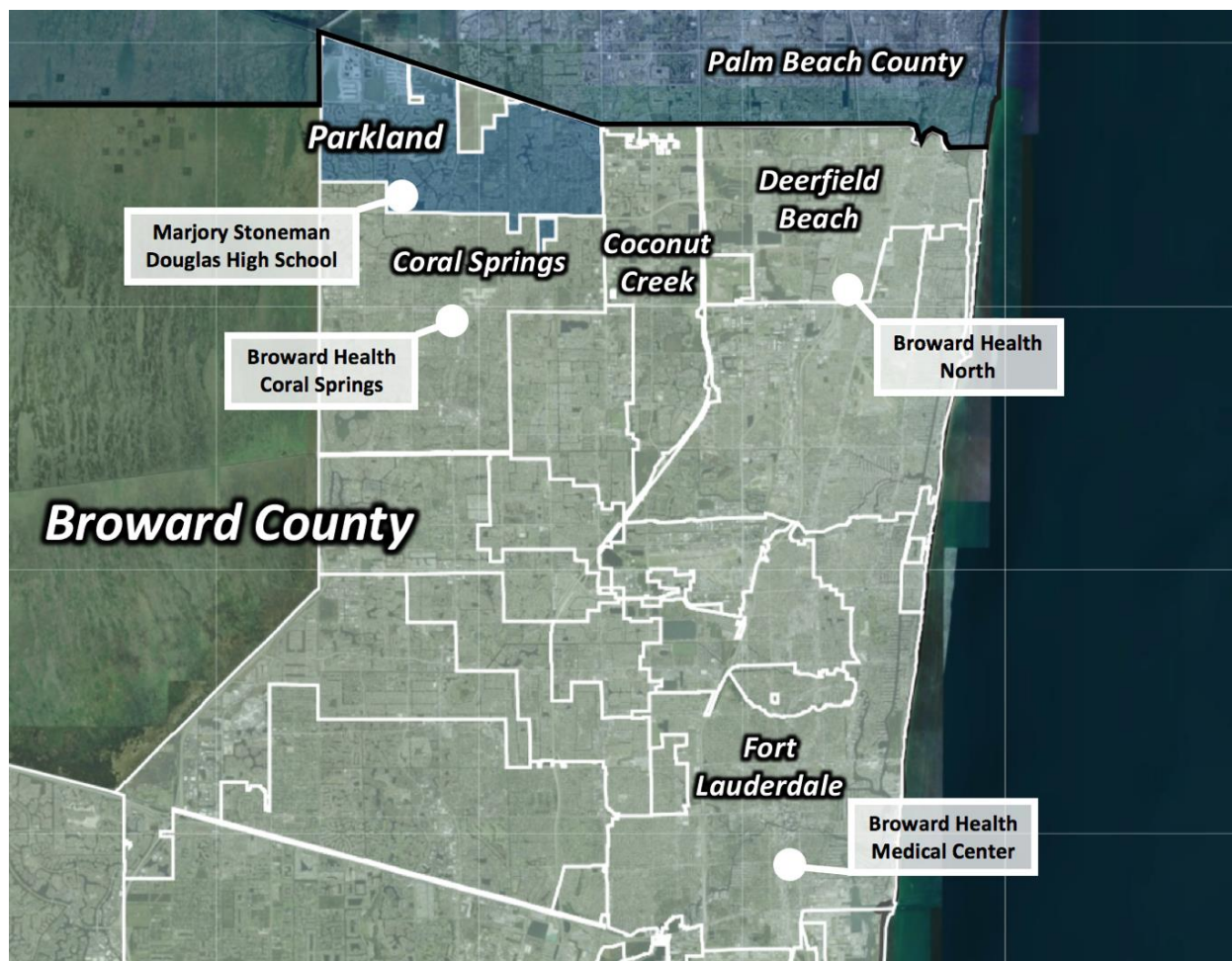
¹⁶¹ NPF assessment team interview with medical director, Broward Health Medical Center, September 19, 2018.

¹⁶² Email from Medical Director, Emergency Department, Broward Health North to Division Chief, EMS, Coral Springs Fire Department. (2018, February 22). Provided to NPF assessment team, September 22, 2018.

¹⁶³ Broward Health. (2018, February 14). Broward Health Hospitals Receive 17 Patients from Stoneman Douglas Shooting. Retrieved from <https://www.browardhealth.org/news/news-articles/broward-health-hospitals-receive-17-patients-from-stoneman-douglas-shooting>

¹⁶⁴ Broward County. (2012). Trauma Plan 2012 to 2017. Retrieved from <https://www.broward.org/MedicalExaminer/Documents/TraumaPlan2012to2017.pdf>

Figure 10: MSDHS and Broward County Hospitals



Source: Esri, Earthstar Geographics, Broward County BMSD PRD EPGMD.

Although information was being communicated through the MEDCOM system, during the incident, more timely and detailed information was relayed through direct lines of communication between public safety and hospital leaders. In one example, having already developed a positive working relationship through joint trainings and regular contacts, the Coral Springs–Parkland Fire EMS division chief called the Broward Health North medical director for the emergency department about the shooting incident before the official MEDCOM messages reached him.¹⁶⁵

Even after MEDCOM began communicating information to hospitals, some responders thought the communication was insufficient. Experiencing challenges accessing the BSO radio system, which the Margate Fire Department uses, the Margate Fire and Rescue EMS division chief became a liaison at Broward Health North to facilitate a faster route of communication.

¹⁶⁵ NPF assessment team interviews with medical director, Broward Health Medical Center, September 19, 2018, and EMS division chief, Coral Springs–Parkland Fire Department, September 17, 2018.

National Promising Practices – 911 and Emergency Communications Models

Kansas City Metropolitan Area: The Mid-America Regional Council (MARC) is a nonprofit association of city and county governments and local elected officials that serves nine counties and 119 cities across the Kansas City metropolitan area—both in Missouri and Kansas. Since 1983, the MARC has coordinated the Kansas City area regional 911 system.¹⁶⁶ The regional system consists of 42 public safety answering points (PSAPs) that answer a combined total of 4.1 million 911 emergency and administrative calls annually.¹⁶⁷

The MARC coordinates the system operations center and a maintenance service hotline, provides support for service calls for 911 answering equipment and the network as a whole, manages all regional communications equipment and software, coordinates community education and outreach regarding how to properly use 911 during an emergency, coordinates tabletop and full-scale training exercises for public safety agencies, provides training for dispatchers and call-takers, and oversees the two major interoperable radio systems across the region.¹⁶⁸

- **Metropolitan Area Regional Radio System (MARRS):** Consortium of 700 megahertz (MHz) and 800 MHz trunked radio systems in the MARC region that provides interoperability for voice and mobile data among approximately 30,000 public safety users from agencies across the region.¹⁶⁹ The MARRS allows for any of the PSAPs to patch their agency talk group to a regional talk group, communicate the availability of the regional talk group to other agencies involved in the response to an event, and manage the communications on the regional talk group.¹⁷⁰ Additionally, the regional system increases redundancy and security of communications. The MARRS allows for each individual public safety agency to retain ownership of their infrastructure, but requires a memorandum of understanding between the agency and the MARC regarding a minimum level of interoperability.¹⁷¹ A management council and series of committees and subcommittees oversee various aspects of the MARRS and provide training and technical assistance to local agencies in coordinating communications on assigned channels.¹⁷²
- **Regional Area Multi-band Integrated System (RAMBIS):** Cross-band, repeated, interoperable radio system with dedicated 800 MHz and ultra-high frequency (UHF) channels that allows users to communicate directly with one another during a multi-agency, multi-discipline, or multi-jurisdiction event.¹⁷³

¹⁶⁶ Mid-America Regional Council. (n.d.). 911 System Overview. Retrieved from <http://www.marc.org/Emergency-Services-9-1-1/Regional-911-System/9-1-1-Services/Regional-911-Services>

¹⁶⁷ Mid-America Regional Council. (2017). Annual Review. Retrieved from <http://www.marc.org/About-MARC/pdf/AnnualReview2017web.aspx>

¹⁶⁸ Ibid.

¹⁶⁹ Ibid.

¹⁷⁰ Metropolitan Area Regional Radio System. (2017, January 18). Standard Operating Procedures. Retrieved from <http://www.marc.org/Emergency-Services-9-1-1/Regional-9-1-1-System/pdf/M12-03-Multi-Agency-Emergency-Response-020117.aspx>

¹⁷¹ Metropolitan Area Regional Radio System Governance Board. (n.d.). Mission Statement of the Metropolitan Regional Governance Board. Retrieved from http://www.marc.org/Emergency-Services-9-1-1/Regional-9-1-1-System/pdf/MARRS_Governance_Board_Goals_Structure.aspx

¹⁷² Mid-America Regional Council. (2017). Annual Review. Retrieved from <http://www.marc.org/About-MARC/pdf/AnnualReview2017web.aspx>

¹⁷³ Mid-America Regional Council. (n.d.). RAMBIS. Retrieved from [http://www.marc.org/Emergency-Services-9-1-1/Interoperability/Systems/RAMBIS-\(1\)](http://www.marc.org/Emergency-Services-9-1-1/Interoperability/Systems/RAMBIS-(1))

City of Orlando and Orange County: The City of Orlando has a primary PSAP operated by the Orlando Police Department (OPD) Communications Division at the Orlando Communications Center and a secondary PSAP operated by the Orlando Fire Department (OFD), co-located in the Orlando Communications Center. All incoming 911 calls from both landlines and cell phones are initially answered by an OPD call-taker and all law enforcement calls are dispatched by an OPD dispatcher or transferred to another appropriate law enforcement agency. All calls for fire, rescue, and hospital transport are transferred to the OFD.¹⁷⁴ All 911 calls received at the Orlando Communications Center that are not responded to by the OPD are automatically rolled over to the Orange County Sheriff's Office (OCSO) Communications Section, which also serves as the primary PSAP for the majority of the rest of Orange County.

Prior to a January 2018 agreement between the two agencies, the OPD and OFD each purchased and maintained their own computer-aided dispatch (CAD) systems and communications equipment. Both agencies used legacy CAD systems developed by different companies and therefore, the systems were unable to communicate with one another.¹⁷⁵ The OPD Radio Services team provides radio infrastructure and radio support to both the OPD and OFD—as well as municipal government radio users and the Greater Orlando Aviation Authority (GOAA)—but does not purchase equipment or require that the agencies purchase similar radios.

Despite these challenges, the OPD and OFD call-takers and dispatchers being co-located alleviated many of the information-sharing issues faced during the response to the attack at Pulse Nightclub on June 12, 2016. The OPD and OFD communications personnel were also able to patch county mutual aid agencies into their systems, so that responders could communicate and coordinate on scene, despite having different radios. The automatic rollover process between the OPD and OCSO, also allowed for the OCSO Communications Section staff to successfully answer the overflow 911 calls.¹⁷⁶

Prince William County, Virginia, Office of Public Safety Communications: Prince William County, Virginia, has a countywide police department and a countywide fire rescue and emergency medical services (EMS) department, but a consolidated primary PSAP. The Prince William County Office of Public Safety Communications (OPSC) is the only PSAP in the county and OPSC call-takers are responsible for answering all landline and cell phone 911 and non-emergency public safety calls from across the county. The OPSC is also responsible for dispatching all county police and fire/EMS personnel as well as local police personnel in two jurisdictions within the county. There are three other jurisdictions within Prince William County that have their own police and fire/EMS departments and have communications centers that serve as secondary PSAPs. OPSC call-takers are required to transfer police-related calls to those three PSAPs. In a critical incident where the call-takers at the secondary PSAPs could become overburdened with calls, OPSC call-takers can dispatch Prince William County police as mutual aid and have a significantly larger number of trunks that can queue the influx of 911 calls. The OPSC also has a backup center that can be operationalized during a critical incident to provide support answering emergency calls.

¹⁷⁴ State of Florida. (2013, April). Orange County Public Safety Answering Point (PSAP). Retrieved from [https://www.dms.myflorida.com/content/download/43565/186319/Orange_Co_State_Plan_Final_Update_April_2013_\(2\)_Emerg_Mgt._-v1docx.pdf](https://www.dms.myflorida.com/content/download/43565/186319/Orange_Co_State_Plan_Final_Update_April_2013_(2)_Emerg_Mgt._-v1docx.pdf)

¹⁷⁵ Prior to an agreement reached in January 2018 to purchase a single enterprise system that includes a CAD, mobile- and field-based reporting solutions, which is slowly being implemented. For more information, see: <https://www.businesswire.com/news/home/20180123005145/en/Tyler-Technologies-Provide-Public-Safety-Solution-City>

¹⁷⁶ Orange County Sheriff's Office. (2016). 2016 Annual Report. Retrieved from <https://www.ocso.com/Portals/0/2016%20Annual%20Report.pdf>

Additionally, the OPSC provides countywide coordination and monitoring for the radio and CAD systems. The county police and fire rescue departments purchase and maintain their own radios and CAD systems. Each public safety discipline has a radio manager that purchases and maintains its department's radios, though all of the radios in the county are made by the same vendor, and the Department of Public Works and Prince William County Public Schools also have radios that are part of the overall system monitored by the OPSC. The two public safety agencies are responsible for creating and overseeing their own fleet maps, defining the subsequent zones and talk groups, and determining their employees' access to each of the zones and talk groups. The zones are generally aligned with the department's geographical division of responsibility and each zone can accommodate up to 16 talk groups. For example, a Prince William County Police Department patrol officer may be given access to all of the zones created for patrol countywide, but only have access to the fire zones that overlap their patrol area. Meanwhile, a battalion chief may have access to all of the zones created for fire/EMS and a larger number of police zones and talk groups. All of the radios are also interoperable at the individual level, so in the event of an emergency response, OPSC personnel do not need to create patches or bridges to allow first responders to communicate directly with one another. Bridges only need to be created to allow mutual aid responders to be brought into specific talk groups to coordinate operations on site.

Like the radio systems, despite having a single group of call-takers and dispatchers, police and fire rescue each have their own CAD systems. There are individuals at each agency responsible for their purchase and maintenance as well, and OPSC employees are trained to operate both systems. The police department's CAD system also interfaces with the Law Enforcement Information Exchange (LInX) system in the National Capital Region to automatically copy any electronic records created by an officer into a format that can be viewed by any of the other connected CAD systems in the region. This allows for federal, state, and local police and criminal justice information—including field contacts, driving offenses, and criminal charges—to be shared across jurisdictions.¹⁷⁷

The OPSC also monitors the overall capacity of the radio network. On a daily basis, the Prince William County system operates at approximately 14 percent of its allotted capacity, which keeps OPSC executives from worrying about emergency communications during a critical incident. Because the Department of Public Works and Prince William County Public Schools each have their own zone and talk groups and contribute the largest number of users, in the event of a significant incident that requires additional capacity, the OPSC can temporarily suspend their access to provide additional capacity to police and fire/EMS.

Additionally, the OPSC facilitates coordination between the public safety disciplines regarding emergency communications. Personnel from the police and fire rescue departments meet weekly with the director of the OPSC to discuss necessary modifications and enhancements to the radios and CAD systems to maximize efficiencies and ensure that requested changes to one department's systems do not negatively impact the other or cause interoperability issues. Issues that rise above minor modifications are brought to the chiefs of the two departments. The two chiefs also serve as the Joint Policy Authority and have equal authority in administrative and managerial oversight of the OPSC. Each chief has a series of individual responsibilities—including setting their own dispatch policies and procedures—that are then implemented by the director of the OPSC and the dispatchers.

¹⁷⁷ Northrop Grumman. (2018). LInX. Retrieved from https://www.northropgrumman.com/Capabilities/PublicSafety/Documents/LInX/LInX_Datasheet_2018.pdf

Findings & Recommendations

The following findings and recommendations are focused on the human and technological communications structures and processes that impacted the public safety response to the shooting at Marjory Stoneman Douglas High School (MSDHS) on February 14, 2018. The National Police Foundation (NPF) assessment team developed these findings and recommendations—based on the limited information made available to the team as of the date of publication of this interim report—to provide Broward County officials with a preliminary set of considerations to address while its after-action review continues. Additional interviews and documents may result in additional findings and recommendations that will be included in the final NPF report.

Finding 1: All Broward County area public safety and government agencies share responsibility to construct strong communications systems and processes that can collectively support the public safety response in and beyond their jurisdictions during incidents requiring a multi-agency/multi-discipline response. It is unavoidable that these systems and processes may be overtaxed and experience some technical issues during large-scale critical incidents. While the casualties and injuries caused on February 14, 2018 are solely the fault of the perpetrator, the collective inability of the public safety and government agencies in Broward County to cooperatively develop, prepare, and strengthen their systems, to include predicting and mitigating potential communications issues, created significant challenges in the response to the MSDHS incident.

Recommendation 1.1: Broward County administrators and officials from the municipalities within the county should work proactively and collaboratively to identify and address challenges and develop a strategy to implement the appropriate solutions.

Finding 2: Within the City of Parkland, emergency 911 calls are routed differently depending on whether they are made from a landline or a cell phone. This affects, and potentially slows, how certain calls are dispatched. It impeded situational awareness during the response to the February 14, 2018 incident. In Parkland, a 911 call initiated from a landline is routed to the Broward County Sheriff's Office (BSO) Regional Communications Division while a 911 call initiated from a mobile device in the same location is routed to the Coral Springs Emergency Communications Center. Additionally, BSO has primary jurisdiction for police services in Parkland, and the Coral Springs–Parkland Fire Department has primary jurisdiction for fire and EMS services for Parkland. Therefore, a call meant for the other service must be manually transferred to the other public safety answering point (PSAP) as opposed to it being automatically routed to the appropriate PSAP.

Having multiple communications centers receiving calls from the same jurisdiction can complicate the ability to exchange time-sensitive and crucial information between responding agencies, particularly during a complex event such as the MSDHS incident. According to the National Fire Protection Association, call transfers can add approximately 30 seconds to a call.¹⁷⁸ During the incident, the BSO Regional Communications Division received one call from a landline phone from MSDHS.¹⁷⁹ The Coral Springs

¹⁷⁸ Mize, A. (2018, July 11). Broward Sheriff's Office Regional Communications. Retrieved from <http://www.fdle.state.fl.us/MSDHS/Meetings/July-Meeting-Documents/Presentations/July-11-930am-BSO-911-Systems-Angela-Mize.aspx>

¹⁷⁹ Broward County Sheriff's Office. (2018, March 8). Marjory Stoneman Douglas High School Shooting Time Line of Events. Retrieved from <https://app.box.com/s/jwall9dpcornuwn92xzy9hgl300xzton>

Emergency Communications Center received the first 911 call from the school and, from the first shots fired through the start of an officer clearing Building 12, attempted to transfer three calls in total to the BSO.¹⁸⁰

Additionally, as a result of the split in functional responsibility between the BSO and Coral Springs, on February 14, information sharing between the communications centers was limited to the manual activation of call transfers and dispatchers providing necessary updates to their own officers on-site. Maintaining situational awareness requires real-time access to crucial incident information from incoming calls and communication between the responding agencies involved.

Even during routine operations, dividing calls between disparate communications centers requires call-takers—who are already tasked with getting maximum information in a minimum amount of time—to take on extra responsibilities in taking the additional steps necessary to get calls to the appropriate PSAP. In addition, it often requires callers in emergency situations to repeat critical information to the call-taker more than once. Call-takers need to rely on rote memorization for certain call transfers and may become more familiar with the process than they otherwise would be if their center received all calls for the municipality.

Recommendation 2.1: Re-evaluate landline and mobile routing based on current usage and calls-for-service data and develop clear agreements as to when and how calls should be transferred during normal operations and during critical events. As cell phone use has expanded and population trends have shifted in the area over the years, City of Parkland officials should collaborate with the BSO and the City of Coral Springs to examine current data on calls-for-service requests. Current information can help to inform the involved stakeholders as they re-evaluate the existing landline and mobile routing process.

All public safety partners should consider that in many areas cell phone usage has replaced landlines as the primary communication method, significantly affecting call volumes and types coming into E-911 centers. Additionally, public safety partners should explore the impact of text and other next generation communication methods for reporting and updating emergencies. This review should include how these emerging methods will be routed among PSAPs.

Recommendation 2.2: Consider emergency communications models and best practices to determine the most appropriate system—including the technological system as well as the system of policies, procedures, protocols, standards of use, memoranda of understanding, and training supporting the technology's use—for Broward County and its municipalities. Different communications models provide promising practices that Broward County and area municipalities can learn from as they make decisions that affect the future of their emergency communications systems. The Broward County Office of Regional Communications and Technology (ORCAT) and user groups can conduct research regarding these systems and share findings broadly to identify what may or may not work in Broward. Full integration can be successful if the equipment and technology involved is compatible and all agencies are comfortable with, and have confidence in, the system.

Finding 3: The various agencies (Broward County, Coral Springs, and Plantation) that fund, service, and operate the various communications systems and equipment—including CAD and radios—each have

¹⁸⁰ Ibid.

their own mission and goals that are at times in conflict with one another. Broward County funds and services the radios and equipment of the regional system. Broward County ORCAT manages the software and data performance. Currently, each public safety agency that uses the regional communications systems and equipment, including the BSO, is responsible for establishing and managing training and setting their own standards of use.

Recommendation 3.1: Having a well-functioning, unified, and fully-integrated regional public safety communications system that meets the needs of all user groups is optimal for public safety in the Broward County region. All parties in the region should take steps that move toward full integration of communications systems.

Recommendation 3.2: If the Coral Springs and Plantation public safety communications systems continue to operate under the current structure, all emergency communication partners must work closely to align goals, help meet each other's needs, and improve practices to maximize the potential of regional and independent communications systems and equipment for routine use as well as during critical incidents. In addition to technological solutions, regional collaboration, coordinated policies and standard operating procedures, mutual agreements, and training development is critical to manage responses to large-scale incidents.

Finding 4: At the time of the February 14, 2018 attack the Broward County regional radio system's formalized inter-agency governance group suffered from disagreement regarding radio operations, which, combined with the poor radio discipline of public safety personnel, impaired the capacity and functioning of the system. The regional radio system does not have a standardized regional fleet map or standardized guidelines on operational use. The governance of the radio system left individual agencies responsible for their own training and usage standards, which can cause disparate understanding and usage of the system by users from different agencies.

During the February 14, 2018 response to the MSDHS incident, an influx of users attempted to access and communicate over the radio system. The high amount of radio activity caused the radio system to experience "throttling," which prevented many users from being able to listen to or communicate over the radio, including users who were front line responders and command personnel. As the county radio system went into throttling, users on scene continued to attempt to use the radio, which exacerbated the problem and proliferated officer safety concerns, as officers and deputies were in crossfire situations without the ability to communicate with each other.¹⁸¹

Recommendation 4.1: Develop and enforce a standardized regional fleet map and common radio operating procedures among regional radio system users. This process should be collaborative and include the County and all end users. Radio system governance should include detailed decision-making protocols and should fully consider the needs of end users throughout the planning, implementation, and maintenance stages. Co-developing a standardized fleet map may reduce channel and access confusion among users and lessen opportunities for radio throttling during high-use periods.

Recommendation 4.2: Reinforce radio discipline and standardized radio protocol to avoid unnecessary radio activity during critical incidents. The governance board should develop training

¹⁸¹ Marjory Stoneman Douglas High School Public Safety Commission. (2018, November 14-15). Commission meeting proceedings. Attended by NPF assessment team member, November 14-15.

and regular practical exercises that teach and test radio discipline under a variety of strenuous situations and considers a variety of radio needs. As an AAR on the response to the bombings at the 2013 Boston Marathon found, agencies should remind their responders of the need for good radio discipline during a large-scale event and provide training to field personnel on the capabilities of their radio systems for use in large operations.¹⁸² Broward County is already taking steps to communicate the importance of radio discipline.¹⁸³ These efforts should continue and should be reinforced during training throughout the many agencies that use the system.

Recommendation 4.3: All public safety agencies in Broward County should train to quickly establish unified incident command, assign a communications leader, and maintain radio discipline to include restricting radio traffic to conveying mission critical information. Incident updates, as well as logistical and other information should be communicated via in-car computers, to prioritize radio system usage.

Recommendation 4.4: Conduct regular audits of the regional radio system to determine any functional challenges and identify new areas to reduce strain. Before and after Broward County implements their new public safety radio system,¹⁸⁴ stakeholders should conduct regular evaluations of the radio system and simulate crisis events to test the system's functionality under strain and identify areas for improvement.

Recommendation 4.5: Consider reducing or migrating non-emergency users to a different system or temporarily disable access to certain users during critical incidents. Groups should also formally agree on how to manage who can access the radio system during critical events.

Finding 5: Some mutual aid agencies, like the Coral Springs Police Department, operated on different CAD and radio systems than the primary responding agency, the BSO. As a result, the agencies were not able to communicate with each other via radio in an effective manner. As a solution, the BSO and Coral Springs Police Department attempted to create manual radio patches to enable communications on scene during the February 14, 2018 event. However, mutual aid agencies reported that some patches simply did not connect the systems, and other patches worked for a period of time but eventually stopped working, deeming them unreliable. In Broward County, the cities of Coral Springs and Plantation maintain their own CAD and radio systems. To communicate on scene during the incident, Coral Springs police attempted to manually set up radio patches to join frequencies used by other public safety agencies and enable radio users on the different systems to speak to each other on the same channel. The radio system vendor has reported that the patch created was successful for approximately six hours; however, Coral Springs responders reported experiencing radio communication issues that should not have occurred with a successful patch.¹⁸⁵

¹⁸² Massachusetts Emergency Management Agency, Massachusetts Department of Public Health, City of Boston, City of Cambridge, Town of Watertown, Massachusetts Bay Transportation Authority Transit Police Department, Massachusetts National Guard, and Massachusetts State Police. *After Action Report for the Response to the 2013 Boston Marathon Bombings*. (2014, December). Retrieved from https://www.policefoundation.org/wp-content/uploads/2015/05/after-action-report-for-the-response-to-the-2013-boston-marathon-bombings_0.pdf

¹⁸³ Broward County. (2018, May). Radio Discipline in a Critical Incident. Provided by Broward County to NPF assessment team, June 1, 2018.

¹⁸⁴ Broward County. (2016, February 12). County Takes Big Step to Replace Aging Emergency Radio System. Retrieved from <https://webapps.broward.org/NewsRelease/View.aspx?intMessageID=7589>

¹⁸⁵ NPF assessment team interview with Coral Springs Communications personnel, June 6, 2018.

Recommendation 5.1: Consider technologies that allow for (bridge) information sharing across different CAD systems, which would enable the transfer of incident information automatically between dispatch centers. In addition to operating different 911 communications centers, the BSO and Coral Springs use different CAD systems. While the use of different CAD systems among different agencies is common, technological solutions—including Law Enforcement Information Exchange (LInX)—are available that would automatically facilitate the transfer of certain information between agencies.

Recommendation 5.2: Agencies should hold joint training and regular practical exercises that can help to identify and resolve communications and coordination issues under a variety of strenuous circumstances in advance of future major incidents.

Recommendation 5.3: Area dispatchers on and off the regional system should formalize protocols for forming and maintaining patches to communicate critical information, particularly in high-stress, fast-moving emergency situations. During the incident, the BSO asked Coral Springs police to initiate a patch because the BSO did not have the Coral Springs main channel on their consoles.¹⁸⁶ The BSO and area municipalities should coordinate to ensure they are prepared to create patches during incidents that involve multiple public safety organizations. While the radio throttling issue inhibited BSO radio communications regardless of the patching challenges, issues with patching should be addressed and their creation should be regularly practiced during joint training that involves communications center staff.

Finding 6: During the response to the MSDHS incident, the Broward County Regional CAD system operated at a slower than normal pace, causing frustration among users. By around 3:00 pm on February 14, 2018, the Broward County CAD supervisor determined that the system was returning responses with a three to four second delay.¹⁸⁷ Upon investigation, the CAD vendor determined that the issue was caused by the large influx of active users in addition to a system update that was being conducted on their CAD system. The system update, which had been approved by the BSO but not Broward County,¹⁸⁸ was identified and stopped at 5:27 pm.¹⁸⁹ While the short delay in CAD system response time does not appear to have impacted operations during the response to the MSDHS incident, the system issue did contribute to general frustration with technology that day.

Recommendation 6.1: Stakeholders should adhere to a formalized and agreed upon customer relationship management (CRM) process for maintenance requests on the CAD system.

Finding 7: Some existing positive established relationships supported communication during the incident response, such as by providing a secondary means for responding agencies to communicate timely and accurate information to area hospitals. While MEDCOM was operational during the response, some responders thought that information on the number of victims and severity of wounds was not being communicated to hospitals in a timely and complete manner. To develop a secondary means of communication, the Margate Fire and Rescue EMS division chief was designated as a liaison at Broward

¹⁸⁶ Marjory Stoneman Douglas High School Public Safety Commission. (2018, July 12). Commission meeting transcript. Retrieved from <http://www.fdle.state.fl.us/MSDHS/Meetings/July-Meeting-Documents/July-12-2018.aspx>

¹⁸⁷ Emails between Broward County and Motorola Solutions, Inc. on CAD Slowness. (2018). Provided by Broward County to NPF assessment team, April 18, 2018.

¹⁸⁸ Ibid.

¹⁸⁹ Motorola Solutions. (2018, March 1). Post Mortem: CAD System Slowness. Provided by Broward County to NPF assessment team, April 18, 2018.

Health North. Experiencing challenges accessing the regional radio communications, the division chief communicated with his division via cell phone and was able to report incoming patient and injury information in real-time to the trauma hospital to help the hospital prepare.

Positive existing relationships additionally facilitated communication between responding agencies and hospitals. Through joint trainings and regular contacts, the Coral Springs–Parkland Fire EMS division chief and Broward Health North medical director for the emergency department had already developed a positive working relationship. When the incident occurred, the Coral Springs–Parkland Fire EMS division chief built on this relationship to personally call the Broward Health North medical director, ensuring they were kept in the loop and would have time to be as prepared as possible before patients began to arrive.¹⁹⁰ When the regional radio was working, the Davie Fire and Rescue chief monitored radio traffic and provided as much real-time information as possible to hospitals on inbound patients.¹⁹¹

Recommendation 7.1: Continue to foster and develop relationships and protocols for communicating with area hospitals. Formalize secondary emergency processes and test effectiveness through regular training and exercises. Broward Health North conducted an active shooter drill approximately 12 months before the MSDHS incident.¹⁹² Similarly, Broward Health Medical Center was involved in the intake of patients during the January 2017 Fort Lauderdale–Hollywood Airport incident.¹⁹³ Hospital administrators report that these prior experiences helped the hospitals to test their processes in advance of this critical incident.¹⁹⁴ Training and exercises that involve hospitals, communications centers, and responding agencies should be conducted regularly to build relationships between organizations and to test communications processes.

Recommendation 7.2: Consider designating a public safety agency liaison to the receiving hospital(s) to facilitate the flow of timely and accurate information during major incidents. In interviews, hospital staff reported a desire for more timely information from the field to help them prepare as much as possible for the influx of patients.¹⁹⁵ While major incident responses will always involve some level of chaos, real-time information can help hospitals to manage their response to the extent possible.

¹⁹⁰ NPF assessment team interviews with emergency medical director, Broward Health North, August 24, 2018, and EMS division chief, Coral Springs–Parkland Fire Department, September 17, 2018.

¹⁹¹ NPF assessment team interview with Coral Springs–Parkland Fire Department personnel, May 31, 2018.

¹⁹² NPF assessment team interview with emergency medical director, Broward Health North, August 24, 2018.

¹⁹³ NPF assessment team interview with medical director, Broward Health Medical Center, September 19, 2018.

¹⁹⁴ NPF assessment team interviews with emergency medical director, Broward Health North, August 24, 2018, and medical director, Broward Health Medical Center, September 19, 2018.

¹⁹⁵ NPF assessment team interview with medical director, Broward Health Medical Center, September 19, 2018.

Conclusion & Next Steps

A series of technical, procedural, and human communications challenges occurred during the response to the Marjory Stoneman Douglas High School (MSDHS) shooting incident on February 14, 2018. The challenges complicated the response as public safety personnel attempted to save the lives of victims.

The communications challenges that impacted the response were directly affected by decisions made and relationships between public safety and government agencies in Broward County and some of its municipalities. In the years leading up to 2018, politics and localized control resulted in communications structures and protocols that were siloed and unable to function across jurisdictional boundaries, even in critical incidents. The series of systemic challenges in communications directly impacted the public safety response to the MSDHS incident.

Since the incident, Broward County, responding agencies, the Broward community, and the State of Florida have all worked to identify and remedy specific issues and improve processes, including communication protocols. For example, Broward County, and Police and Fire Chiefs' Associations have established a formalized training for radio use that is being utilized by law enforcement and fire/EMS personnel. Along with the training, the County has also produced and delivered officer radio usage tips on palm cards and an online training video. Updated announcements to be used by dispatchers for radio operations during critical incidents have also been provided. Broward County has also begun implementation of the Local Government Radio System to accommodate non public safety users and the construction of the new P25 radio system. In addition, the Coral Springs and Broward County communications centers have established a procedural agreement directing that when Coral Springs receives a Parkland fire call, once fire services are dispatched, Coral Springs police dispatch will use the district talk group to notify the BSO of the Coral Springs response. In addition, the Coral Springs Emergency Communications Center now has immediate access to a BSO radio set on the Parkland channel in their communications center. Coral Springs Police Dispatch has also added and can now monitor a Parkland channel. The BSO channel is now programmed into the Coral Springs–Parkland Fire channel. Finally, the main Coral Springs dispatch channel has been programmed into the BSO dispatch console, affording direct radio communications and the ability for the BSO to initiate a patch.¹⁹⁶

These initial steps should give way to a more comprehensive and robust public safety communication structure and process. The public safety and government agencies within Broward County have a collective responsibility to cooperatively discuss, develop, and continuously strengthen their communication systems—from their specific technology systems to their systems of policies, procedures, protocols, standards of use, memoranda of understanding, and, training. It is also imperative that these jurisdictions work to develop and implement a system that meets the ongoing needs of all public safety user groups to best secure Broward County and the surrounding jurisdictions.

¹⁹⁶ Marjory Stoneman Douglas High School Public Safety Commission. (2018, November 14-16). Commission meeting proceedings. Attended by NPF assessment team member, November 14-16.

Appendix A: Methodology Detail

At the request of Broward County, the National Police Foundation (NPF) created an assessment team to conduct an after-action review (AAR) of the Marjory Stoneman Douglas High School (MSDHS) incident on February 14, 2018. As part of this review, Broward County requested that the NPF prioritize a review of public safety communications. The NPF assessment team, comprising subject matter experts in public safety communications, leadership, operations, decision-making, tactics, school facilities, and critical incident response, developed a comprehensive methodology to thoroughly review and assess public safety communications related to the incident.

The assessment approach involved four means of information gathering and collection: (1) open source media review, (2) on-site data collection, (3) resource material review, and (4) off-site data collection and research. Each method is described in more detail in the sections that follow.

Open Source Media Review

Throughout the life of the review, NPF staff have collected, reviewed, and referenced open source media. The team has read dozens of newspaper and magazine articles, watched videos, and more. This research has provided context for the interviews and other research conducted in relation to the MSDHS incident.

On-site Data Collection

The NPF assessment team conducted two site visits: May 10, 2018, and June 25-29, 2018. During these site visits, the assessment team conducted semi-structured individual interviews and meetings with the Broward County Commission MSDHS After-Action Task Force, and local officials and law enforcement leaders. The assessment team also conducted conference calls with individuals involved in the response to the incident or otherwise have knowledge of the communications systems relied on that day, including the technology and procedures supporting its use.

More than 30 individuals were interviewed during these site visits and phone interviews:

- Broward County Commissioners
- Broward County Sheriff's Office (BSO) Regional Communications leadership
- BSO Department of Fire Rescue leadership
- Broward County Office of Regional Communications and Technology leadership
- Broward County Police Chiefs Association president
- Broward County Fire Chiefs Association leaders
- Broward County Emergency Management
- Broward Health Medical Center Emergency Preparedness Manager
- Broward Health North Medical Director
- Coral Springs Police Department (CSPD) command staff
- Coral Springs–Parkland Fire Department (CSPFD) command staff
- Coral Springs Emergency Communications Center administration
- Mission Critical Partners consultants
- Motorola personnel
- Plantation Police Department communications personnel

Resource Review

The NPF assessment team collected and reviewed the BSO and City of Coral Springs' policies, procedures, reports, data, and audio and video from the incident. In addition, Broward County provided presentations, AARs, assessments, and other reports conducted by other agencies and organizations. The NPF assessment team also followed the publicly available MSDHS Public Safety Commission proceedings and reviewed relevant presentations, transcripts, and incident timelines. Each resource was reviewed to better understand the department's response to the incident. Resources reviewed included the following:

- BSO Regional Communications Standard Operating Procedures Manual
- BSO Department of Law Enforcement Standard Operating Procedures
- CSPD and CSPFD Standard Operating Procedures
- BSO training outlines
- BSO mutual aid agreements
- CSPD and CSPFD incident reports
- BSO 911 call transcripts
- Mission Critical Partners' Radio Analysis Report for Broward County
- Fitch's E-911 Assessments for Broward County
- Motorola memos and emails to Broward County on the Broward County radio and CAD systems
- Available after-action reports by responding agencies
- BSO and MSDHS Public Safety Commission incident timelines

The team also reviewed hours of records—including 911 calls, video footage at MSDHS on the day of the incident, and other records made public by Broward County—and reviewed open source media articles, news clips, and relevant video and audio regarding the incident.

Off-site Data Collection

In addition to the information collected from Broward County, and to ground the incident review in national standards, model policies, and recognized promising practices, the NPF assessment team researched and reviewed scholarship on public safety communications with an emphasis on critical incidents. The team also reviewed and analyzed relevant critical incident reviews and AARs from national and international incidents. The team conducted relevant research in other areas published by researchers from academia and from organizations including the following:

- Federal Communications Commission
- National Emergency Number Association
- National Fire Protection Association
- National Police Foundation
- Police Executive Research Forum
- U.S. Department of Homeland Security
- U.S. Department of Justice

Analysis

The NPF assessment team used the totality of the information collected to conduct a gap analysis, which focused on identifying key areas to develop a set of recommendations for Broward County, involved agencies, and the larger public safety field.

Appendix B: Glossary

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| 800 Megahertz (MHz) | The range of frequencies that are utilized in the radio network. The term is applied to any network that broadcasts on frequencies between 700-800 MHz. ¹⁹⁷ |
| 911 Duty Officer | The Broward County Sheriff's Office Regional Communications Division 911 Duty Officers are responsible for supervising the operations of their public safety answering point (PSAP) during their shift. In the event of an active shooter/mass casualty incident, the Duty Officer is responsible for: <ol style="list-style-type: none"> 1. Confirming the initiation of the incident in the computer-aided dispatch (CAD) system in accordance with normal call-taking procedures; 2. Coordinating the event by accessing the line through the supervisor's telephone workstation and listening to the call; 3. Looking for key elements of the call; 4. Monitoring the Department of Law Enforcement (DLE) talk group from a portable radio in order to facilitate the rapid dissemination of information; and, 5. Monitoring additional pending call activity for additional events that mimic, shadow, or can be in any way related to the initial event.¹⁹⁸ |
| Answering Position | The equipment and workstation at which 911 calls are answered and responded to by call-takers and dispatchers. ¹⁹⁹ |
| Automatic Location Identification (ALI) | The automatic display at a PSAP of the caller's telephone number, the address/location of the telephone, and supplementary emergency services information of the location from which the call originates. ²⁰⁰ |
| Automatic Number Identification (ANI) | Telephone number associated with the access line from which a call originates. ²⁰¹ |
| Bonk | Sound emitted when two or more radio users are attempting to talk at the same time. If a bonk occurs the second user attempting to speak will have to wait until the first user is finished talking before they can speak. ²⁰² |
| Bridge | The process to connect a third party onto an existing call. ²⁰³ |
| Catchment Area | The geographical area served by an institution. ²⁰⁴ |

¹⁹⁷ City of Phoenix. (n.d.). Glossary. Retrieved from <https://www.phoenix.gov/fire/directory/fire-operations/phoenix-regional-radio-network/glossary>

¹⁹⁸ Broward County Sheriff's Office. (2017, January 20). Regional Communications Operations: Standard Operating Procedures Manual. Provided by Broward County Sheriff's Office to NPF assessment team, June 29, 2018.

¹⁹⁹ National Emergency Number Association (NENA). (2018, April 13). NENA Master Glossary of 9-1-1 Terminology. Retrieved from https://cdn.ymaws.com/www.nena.org/resource/resmgr/standards/NENA-ADM-000.22-2018_FINAL_2.pdf

²⁰⁰ Ibid.

²⁰¹ Ibid.

²⁰² City of Phoenix. (n.d.). Glossary. Retrieved from <https://www.phoenix.gov/fire/directory/fire-operations/phoenix-regional-radio-network/glossary>

²⁰³ National Emergency Number Association (NENA). (2018, April 13). NENA Master Glossary of 9-1-1 Terminology. Retrieved from https://cdn.ymaws.com/www.nena.org/resource/resmgr/standards/NENA-ADM-000.22-2018_FINAL_2.pdf

²⁰⁴ Merriam-Webster. (n.d.). Catchment area. Retrieved from <https://www.merriam-webster.com/dictionary/catchment%20area>

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| Computer-Aided Dispatch | A computer-based system that aids PSAP call-takers and dispatchers by automating selected dispatching and record-keeping activities. ²⁰⁵ |
| Enhanced 911 (E-911) | Telephone system which includes network switching, database, and PSAP premise elements capable of providing automatic location identification data, selective routing, selective transfer, fixed transfer, and a callback number. Any enhanced 911 service so designated by the Federal Communications Commission. ²⁰⁶ |
| Fleet map | The configuration of the features and programming of parameters of a trunked radio system to function according to the unique operational requirements of each participating agency. A fleet map determines how the trunked radio system for each user group of an organization is controlled to ensure that resources are used efficiently. A fleet map also provides a structured approach to the management of many radio users, while providing for expansion or changes within an organization. ²⁰⁷ |
| Interoperability | The capability for disparate systems to communicate with one another. ²⁰⁸ |
| Patch | The connection of two or more talk groups, radio channels, or voice paths to one another. ²⁰⁹ |
| Project 25 (P25) | A suite of standards developed to provide digital voice and data communications systems to public safety and first responders. |
| Public Safety Answering Point (PSAP) | <p>An entity responsible for receiving 911 calls and processing those calls according to a specific operational policy. There are multiple types of PSAPs, including:</p> <ul style="list-style-type: none"> • Primary: An entity to which 911 calls are routed directly from the 911 Control Office; • Secondary: An entity to which calls are transferred from a primary PSAP; • Alternate: A PSAP designated to receive calls when the Primary PSAP is unable to do so; and, • Consolidated: A facility where multiple public safety agencies choose to operate as a single 911 entity. <p>Both the BSO Regional Communications Division and the Coral Springs Emergency Communications Center are Primary PSAPs.²¹⁰</p> |
| Relay | Forwarding of pertinent information by a PSAP attended to the appropriate response agency. ²¹¹ |
| Talk group | A group of radios that can share calls and messages as a group. ²¹² |
| Throttling | When a large number of radio users attempt to access the system at the same time, exceeding the capacity of the controller's buffer. The controller denies further |

²⁰⁵ National Emergency Number Association (NENA). (2018, April 13). NENA Master Glossary of 9-1-1 Terminology. Retrieved from https://cdn.ymaws.com/www.nena.org/resource/resmgr/standards/NENA-ADM-000.22-2018_FINAL_2.pdf

²⁰⁶ Ibid.

²⁰⁷ WCCCA Technical Services. (2014, April). Fleet Mapping For Trunked Radio Systems. Retrieved from <http://www.wccca.com/users/forms/fleetmap.pdf>

²⁰⁸ National Emergency Number Association (NENA). (2018, April 13). NENA Master Glossary of 9-1-1 Terminology. Retrieved from https://cdn.ymaws.com/www.nena.org/resource/resmgr/standards/NENA-ADM-000.22-2018_FINAL_2.pdf

²⁰⁹ Mission Critical Partners. (2015, September). Comprehensive Radio Analysis Report. Provided by Broward County to NPF assessment team, April 18, 2018.

²¹⁰ National Emergency Number Association (NENA). (2018, April 13). NENA Master Glossary of 9-1-1 Terminology. Retrieved from https://cdn.ymaws.com/www.nena.org/resource/resmgr/standards/NENA-ADM-000.22-2018_FINAL_2.pdf

²¹¹ Ibid.

²¹² WCCCA Technical Services. (2014, April). Fleet Mapping For Trunked Radio Systems. Retrieved from <http://www.wccca.com/users/forms/fleetmap.pdf>

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| | attempts until the buffer is cleared, resulting in system busy tones and/or error messages received by the radios attempting to access the system. ²¹³ |
| Transfer | A feature which allows the PSAP call-taker to redirect a 911 call to another location. ²¹⁴ |
| Trunk | A communication path between central office switches, or between the 911 Control Office and the public safety answering point. ²¹⁵ |

²¹³ Mission Critical Partners. (2015, September). Comprehensive Radio Analysis Report. Provided by Broward County to NPF assessment team, April 18, 2018.

²¹⁴ National Emergency Number Association (NENA). (2018, April 13). NENA Master Glossary of 9-1-1 Terminology. Retrieved from https://cdn.ymaws.com/www.nena.org/resource/resmgr/standards/NENA-ADM-000.22-2018_FINAL_2.pdf

²¹⁵ Ibid.

Appendix C: About the National Police Foundation

The National Police Foundation is America's oldest non-membership, non-partisan police research organization. We were founded in 1970 by the Ford Foundation to advance policing through innovation and science. We integrate the work of practitioners and social scientists to facilitate effective crime control and the progress of democratic policing strategies. We have a wide breadth of projects throughout the U.S. and Mexico. Among other efforts, we conduct scientific evaluations of policing strategies, organizational assessments, critical incident reviews, police data projects and issue timely policing publications critical to practitioners and policymakers. We also have a strong interest in officer safety and wellness, preventable error in policing and helping policing enhance community trust and confidence, especially in the area of police use-of-force.

National Police Foundation assessments and incident reviews include:²¹⁶

- [*After-Action Review of the Orlando Fire Department Response to the Attack at Pulse Nightclub*](#)
- [*2017 Presidential Inauguration First Amendment Assembly Independent Law Enforcement Review*](#)
- [*Advancing Charlotte: A Police Foundation Assessment of the Charlotte-Mecklenburg Police Department Response to the September 2016 Demonstrations*](#)
- [*Rescue, Response, and Resilience: A critical incident review of the Orlando public safety response to the attack on the Pulse nightclub*](#)
- [*Managing the Response to a Mass Mobile Shooting: A Critical Incident Review of the Kalamazoo, Michigan, Public Safety Response to the February 20, 2016, Mass Shooting Incident*](#)
- [*Engaging Communities One Step at a Time: Policing's Tradition of Foot Patrol as an Innovative Community Engagement Strategy*](#)
- [*Collaborative Reform Initiative: An Assessment of the St. Louis County Police Department*](#)
- [*Maintaining First Amendment Rights and Public Safety in North Minneapolis: An After-Action Assessment of the Police Response to the Protests, Demonstrations, and Occupation of the Minneapolis Police Department's Fourth Precinct*](#)
- [*Bringing Calm to Chaos: A critical incident review of the San Bernardino public safety response to the December 2, 2015 terrorist shooting incident at the Inland Regional Center*](#)
- [*Police Under Attack: Southern California Law Enforcement Response to the Attacks by Christopher Dorner*](#)

²¹⁶ For a full list of National Police Foundation publications, visit <https://www.policefoundation.org/publications/>.

Appendix D: About the Authors

Frank G. Straub, PhD, is the Director of Strategic Studies and the Center for Mass Violence Response Studies (CMVRS) at the National Police Foundation. Dr. Straub provide on-site project management, managed the document review process, coordinated the work of subject matter experts, and provided law enforcement guidance to the project. Dr. Straub has conducted in-depth studies of the San Bernardino terrorist attack, the Kalamazoo mass shooting, and the Orlando Pulse nightclub shooting. He is currently leading a review of the Marjory Stoneman Douglas High School shooting. Dr. Straub leads the CMVRS' Averted School Violence project, the National Applied Research and Data Platform and a countering violent extremism project in Boston. Dr. Straub is a 30-year veteran of federal and local law enforcement, having served as the police chief in Spokane, Washington; the Public Safety Director in Indianapolis; the Public Safety Commissioner in White Plains, New York; and the New York City Police Department's Deputy Commissioner of Training and Assistant Commissioner for Counterterrorism. He also served as a member of the FBI-NYPD Joint Terrorism Task Force during his tenure with the U.S. State Department's Bureau of Diplomatic Security and the U.S. Naval Criminal Investigative Service. Dr. Straub is a non-resident fellow at West Point's Center for Combatting Terrorism providing expert advice regarding the domestic law enforcement response to terrorism and acts of mass public violence. Dr. Straub holds a B.A. in Psychology, a M.A. in Forensic Psychology, and a Ph.D. in Criminal Justice. He has co-authored a book on performance-based police management as well as articles and reports on school violence, critical incident response, community policing, police reform, youth violence and homeland security.

Blake Norton, provided off-site leadership and oversaw all planning, organization, and conduct of activities related to this report. As the Senior Vice President at the National Police Foundation, Ms. Norton oversees National Police Foundation projects aimed at providing local police agencies with assessments and technical assistance to improve operations. Prior to joining the National Police Foundation in March 2014, she was the Division Director for Local Government Initiatives at the Council of State Government's Justice Center. She oversaw four program areas: Law Enforcement, Mental Health, Reentry, and School Discipline, providing technical assistance to cities, counties, and nonprofits focused on cross-system collaborations between law enforcement and other criminal justice entities, with a significant focus on the intersection between law enforcement and behavioral health systems. Before joining the Justice Center, Blake spent more than 19 years with the Boston Police Department, where her last position was as the Director of Public Affairs and Community Programs. Blake helped shape the agency's reentry efforts and successfully worked with citizens and faith-based organizations to advance consensus-based strategies for improving public safety. She designed and managed the police department's community affairs activities, including programs for court-involved and at-risk youth. She received her B.A. from the University of Massachusetts and her M.Ed. from Boston University.

Jennifer Zeunik, is the Director of Programs, and served as a writer, editor, and quality control manager on the report. Ms. Zeunik has 20 years of public sector and nonprofit project management experience, working closely with all levels of government. In her career, Ms. Zeunik has provided strategic management expertise to international, federal, state, and local criminal justice clients focused on justice policy research, business development activities, program management, strategic planning, training and technical assistance management, and development of strategic communications. She served as a lead writer on numerous published reports throughout her career, including the *IACP National Policy Summit on Community-Police Relations: Advancing a Culture of Cohesion and Trust* report as well as the COPS Office-funded Police Foundation Orlando Pulse nightclub critical incident review, [*Rescue, Response, and*](#)

[*Resilience*](#); the San Bernardino terrorist shooting critical incident review, [*Bringing Calm to Chaos*](#); and, [*Collaborative Reform Initiative: An Assessment of the St. Louis County Police Department*](#).

Dr. James “Brett” Meade, is a Senior Law Enforcement Program Manager, who provided on-site support and served as a writer and editor on the report. Chief (Ret.) Brett Meade joined the National Police Foundation in November 2018 after serving over 36 years policing in complex urban environments, Chief Meade has over 22 years command/supervisory experience, with 17 years in command and executive level positions of increased responsibility, accountability, and diversity requiring specialized leadership skills, traits, and dedication. In September 2014, he was appointed Deputy Chief of Police for the University of Central Florida Police Department. UCF is one of the largest universities in the United States with over 80,000 students, faculty, and staff. In October 2018, he retired with a promotion to Chief of Police. Chief Meade previously served almost 25 years with the Orange County Sheriff’s Office, A 2,500 employee CALEA Flagship accredited law enforcement agency with annual operating budget of \$200 million retiring as a Patrol Commander, Chief Meade has practical command leadership in administrative as well as operational positions to include Campus Law Enforcement, Internal Affairs, Tourism Safety, Intelligence, Patrol Command, and Youth Prevention programs. He embraces Community Policing, Evidence Based and Intelligence Led Policing philosophies, with documented and proven success in crime reduction by developing and implementing successful collaborative community strategies, anti-gang initiatives, and prevention programs. He possesses extensive command experience in managing large scale events and disaster response to include operational planning, deployment, development, and evaluation utilizing the Incident Command System (ICS) and National Incident Management System (NIMS) and holds a SECRET security clearance with the United States Department of Defense. Chief Meade is a accomplished public speaker, instructor and recognized expert in domestic terrorism specializing in the sovereign citizen movement, having trained over 8,000 personnel across the State of Florida on Sovereign Citizen Encounters. He was instrumental in obtaining legislation designed to protect public officials and citizens from paper terrorism tactics employed by sovereign citizens within the State of Florida.

Ben Gorban, is a Senior Project Associate, and served as a document reviewer and writer and editor on the report. with more than nine years of experience supporting law enforcement–related projects including the provision of technical assistance and policy analysis support on projects related to countering violent extremism, community policing, and after-action reviews of public safety responses to critical incidents. Mr. Gorban has served as a team member, writer, and editor for a series of National Police Foundation after-action reviews including: [*Rescue, Response, and Resilience: A critical incident review of the Orlando public safety response to the attack on the Pulse nightclub*](#) and [*Managing the Response to a Mobile Mass Shooting: A Critical Incident Review of the Kalamazoo, Michigan, Public Safety Response to the February 20, 2016, Mass Shooting Incident*](#). Prior to joining the National Police Foundation, Mr. Gorban spent more than five years at the International Association of Chiefs of Police. Mr. Gorban’s areas of expertise include research, resource development, and information dissemination. He received his MS in Justice, Law, and Society from American University in 2011 and his BA in both Philosophy and Justice, Law, and Society from American University in 2009.

Rebecca Benson, is a Senior Project Associate, provided on-site support and served as a writer and editor on the report. Prior to joining the National Police Foundation, she most recently served as a Crime and Intelligence Analyst with the Los Angeles Police Department (LAPD) Olympic Division, responsible for preparing and providing analytical support to assist in the creation of new area boundaries, mapping and documenting community resources, activities and special locations as well as analyzing personnel resources and shift schedules. Following the official opening of the division, she was responsible for daily

crime analysis and mapping of the division. Ms. Benson also led weekly crime control meetings with the Command staff and organized strategies around prevention and deterrence with Command, Detective, and Senior Lead Officers. She received numerous commendations and was awarded Civilian of the Year for 2009. Ms. Benson began her law enforcement career and spent many years with the Boston Police Department.

Joyce Iwashita, is a Project Associate, and served as a document reviewer and writer and editor on the report. Ms. Iwashita has been a team member on multiple National Police Foundation after-action reviews and operational assessments. A Harry S. Truman Scholar, Ms. Iwashita received her BA in Economics from Lewis & Clark College and is currently pursuing her MA in Security Studies with a concentration in Technology and Security from Georgetown University.

Charles Jennings, PhD, is a public safety academic, researcher, and consultant. Dr. Jennings, FIFireE, CFO, is Director of the Christian Regenhard Center for Emergency Response Studies (RaCERS) at John Jay College of Criminal Justice, where he is also Associate Professor in the Department of Security, Fire, and Emergency Management. He has taught at the College since 1997, serving from 2002–2008 as Deputy Commissioner of Public Safety for the City of White Plains, New York. He worked on issues of earthquake loss estimation and social and economic aspects of disaster in his graduate work in City and Regional Planning under Barclay G. Jones III at Cornell University. Dr. Jennings has completed projects and contracts for the Federal Emergency Management Agency (FEMA); New York City Office of Emergency Management; the New York-New Jersey-Connecticut-Rhode Island Regional Catastrophic Planning Team; and numerous local governments. He worked with FEMA Headquarters and Region II staff to develop the College's graduate curriculum in Emergency Management in 2000, and recently completed development of additional courses to enable a full Master's degree in Emergency Management, which is in the approval process. Dr. Jennings publishes on emergency communications and policy and community risk, and he co-edited *Managing Fire and Emergency Services*, the standard text in the field. He has been involved in the investigation of major fires for the United States Fire Administration, including several significant high-rise incidents. Dr. Jennings is currently an alternate to the National Fire Protection Association's High Rise Building Safety Advisory Committee. He was recognized in 2012 as a Fellow of the Institution of Fire Engineers.

Michael L. Johnson, is a Certified Protection Professional and CEO of Clearpath Alerts, a Fort Lauderdale, Florida-based security technology company which provides domestic and international entities with risk, security and dynamic communication technology solutions. Prior to joining Clearpath, Mr. Johnson served as president of Clearpath, managing the day-to-day operations and ensuring multi-national corporate clients received the best international risk mitigation solutions. Mr. Johnson also spent almost 27 years in three different federal law enforcement agencies, last serving in senior management as a Special Agent in Charge at the Diplomatic Security Service and the Office of Export Enforcement.



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